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An historical analysis of predisposing and facilitating factors related to historically Black colleges' and universities' participation levels in federally-sponsored science and technology programs.

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AN HISTORICAL ANALYSIS OF PREDISPOSING AND FACILITATING FACTORS RELATED TO HISTORICALLY BLACK COLLEGES' AND UNIVERSITIES' PARTICIPATION LEVELS IN FEDERALLY-SPONSORED SCIENCE AND TECHNOLOGY PROGRAMS

A Dissertation Presented

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ABSTRACT

AN HISTORICAL ANALYSIS OF PREDISPOSING AND FACILITATING FACTORS RELATED TO HISTORICALLY BLACK COLLEGES' AND UNIVERSITIES' PARTICIPATION LEVELS IN FEDERALLY-SPONSORED SCIENCE AND TECHNOLOGY PROGRAMS

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This study examines and evaluates the effectiveness of the Federal Government's commitment to provide increased support to historically Black colleges and universities (HBCUs) in the academic areas of science and engineering technology programs. It focuses on the implementation and results of Executive Order 12320, signed on September 15, 1981, by President Ronald Reagan, which mandates Federal Government Agencies and Departments to eliminate known barriers to HBCU participation in areas of research and development.

The study considers the influences of the Federal Government's impact and historical relationships with HBCUs for the period 1981-1988. Additionally, it examines the level of efforts made to eliminate the underrepresentation of minorities in science and technology programs.

Data evaluated for the study was acquired from Federal Government Agencies and Departments, HBCUs, private sector businesses and corporations, organizations, and other sources. It was analyzed to determine levels of science and non-science funding support for HBCUs and served as the historical framework for the study. The primary institutional sources of information and data collection for this study were from a number of HBCUs selected based upon identified and stated factors which contributed to various participation levels in Federally-sponsored science and technology programs. The target population was the universe of the HBCUs (two-year, four-year, and graduate level institutions), with the sample population chosen to represent all HBCUs on the basis of levels of participation in research and development, science and technology programs. Archival data was collected from major Federal reports, supplemented by personal interviews with educational experts and institutional officials.

Several important factors emerged from this study. Foremost, the data suggest that HBCUs which received the greatest amount of Federal funding and support in the science areas were more likely to receive the greatest amount of funding in non-science academic areas. The findings also suggest that Federal Government support in the non-science academic science engineering programs served as

factors which enhance the potential and competitiveness of HBCUs.

Regarding the successfulness and effectiveness of the Federal Government and private sector commitment to HBCUs, there have been extensive efforts to support active participation of HBCUs in science and non-science programs.

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C H A P T E R I

INTRODUCTION AND STATEMENT OF THE PROBLEM

Introduction

Throughout the history of this country, educational institutions have been a source of new ideas, innovations, and inventions. Faculty at research-oriented institutions are sought to develop new methods and technologies that could prevent, control, and treat major health problems, advance technologies in the engineering and computer fields, and contribute to advances in the space industry. Historically Black colleges and universities (HBCUs) provide credible models for aspiring Black youth. They provide special group-oriented traditional education enclaves in which their students can begin preparation for and make the necessary transition from isolation to mainstream society. They serve as conduits for the perpetuation and transmission of culture to successive generations of Black students.

HBCUs are those institutions founded primarily for Black Americans. Most of these institutions are 50 to 100 years old. Of the 106 HBCUs, 61 are private (both church affiliated and secular) and 45 are public institutions. They are located in 15 states, predominantly in the southeast. They range in size from small junior and four-year colleges with fewer than 500 students to universities with

graduate and professional schools with enrollments of more than 10,000 students. In 1980, HBCUs enrolled approximately 218,000 students of which about 90 percent were Black Americans.[1]

A recent publication by the U. S. Department of Education revealed that HBCUs accounted for 30 percent of all degrees conferred to Black Americans nationwide.[2] Further, more than 25 percent of Black lawyers and doctors in America finished their undergraduate training at HBCUs. These data show that HBCUs continue to be a major Black educational resource, not only in terms of access but in terms of the share of degrees completed.

These colleges and universities face most of the problems confronting all institutions of higher education, such as Federal influence, decreasing enrollments, curriculum relevance, faculty/staff unionization, as well as limited financial resources. Before the passage of the Higher Education Act of 1965 and its amendments, Black colleges and universities received minimal support from the Federal Government. This legislation included, among other titles, Title III--"Strengthening Developing Institutions"--which was widely interpreted at that time as a direct intercession favoring Black colleges and universities and as a Federal commitment to their survival and enhancement. This legislation, along with other programs under the Economic Opportunity Act of 1964 and certain student financial aid

programs, was construed to be contributing elements in the Federal effort to counteract the historical effects of racial inequality and discrimination.

A review of the history of grant awards reveals that most of the awards by Federal agencies have been made to institutions with graduate programs. Of the 106 HBCUs in the United States, less than 20 have science, computer science, and engineering graduate programs, while about 80 percent are liberal arts undergraduate institutions.[3]

Although the primary mission of an undergraduate institution is teaching, many educators believe that exposure to and training in research are important components of undergraduate education. Additionally, such a focus provides enrichment to students' educational background and learning experiences, provides opportunities for careers in research, and serves as motivation to pursue graduate studies. In order for HBCUs to become competitive with other institutions of higher education, as well as to offer quality education, an academic research atmosphere is an important prerequisite.

History of Federal Commitment to HBCUs

The Federal commitment to HBCUs is best explained and understood through the social, political, economic, and cultural forces that have shaped race relations in this country since the reconstruction era.[4] Prior to the

emancipation of the slaves in 1863, teaching Blacks to read and write was strictly forbidden in many southern states. Until the Civil War, Blacks were primarily educated via apprenticeships, non-degree courses, training abroad, and self-study. The first schools to state clearly their aim to award baccalaureate degrees to Blacks were Lincoln University in Pennsylvania (1854) and Wilberforce University in Ohio (1865).

The first Federal commitment to HBCUs came via the Second Morrill Act of 1890. During the mid- and late-19th century, attempts to establish colleges of agriculture and industry in certain eastern and mid-western states resulted in the creation of land-grant colleges designed to educate the general populace. Legislation creating these colleges was introduced by Congressman Justin Morrill. Under the Morrill-Wade Act of 1862, grants of land were provided to designated State colleges for the teaching of subjects related to agriculture, mechanical arts, and military sciences. While the first Morrill Act of 1862 did not include any of America's 4.5 million Blacks, because these land-grant colleges were intended to serve only Whites, the Second Morrill Act of 1890 called for land-grant colleges to serve Blacks as well as Whites (16 of the historically Black colleges and universities were established under this legislation). The Second Morrill Act also provided for Federal grants.

For the next six decades, American higher education remained extensively segregated. In the academic year 1952-1953 (the year before the Supreme Court decision in Brown vs. Board of Education declaring racial segregation in education to be unconstitutional), there were only 453 Blacks in the 22 public integrated colleges in the South. The remaining Blacks were enrolled in historically Black colleges. As recently as 1960, 96 percent of Black college students were enrolled in HBCUs.

In the past two decades, HBCUs have had to adjust to the major strides made in race relations. This adjustment has resulted in the Federal Government focusing its attention on the HBCUs. Federal involvement in HBCUs since 1960 has included:

- The Higher Education Act of 1965 directed the Commissioner of Education to carry out a program of special assistance to strengthen the academic quality of developing institutions "which are struggling for survival and are isolated from the mainstream of academic life." The result has been the awarding of hundreds of millions of dollars to HBCUs since 1965 through the Title III program.
- A 1969 directive from President Richard Nixon to all Executive Agencies to improve Federal cooperation with HBCUs. The directive

mandated "Annual Survey Reports" by the Federal Interagency Committee on Education (FICE) regarding the participation of HBCUs in Federal higher education programs. These surveys were used to monitor and track Federal funds going to HBCUs and to make adjustments where appropriate.

- A 1972 National Science Foundation-sponsored College Science Improvement Program (COSIP) providing institutional support for historically Black four-year colleges. The same year, the COSIP program included Research Initiation Grants for faculty members at minority institutions. The program later became the MISIP program and now is operated by the Department of Education. Legislation for the Department of Education's College Housing Loan Program provides a 10 percent set-aside of appropriated funds to be given to HBCUs.
- President Jimmy Carter's Executive Order 12232, dated August 8, 1980, directing the Secretary of Education to carry out a government-wide initiative to achieve a significant increase in the participation of HBCUs in Federal programs.

- President Ronald Reagan's Executive Order 12320, dated September 15, 1981, directing the Secretary of Education to strengthen the capacity of HBCUs to provide quality education, overcome the effects of discriminatory treatment, and eliminate barriers which prevent HBCUs from participating in Federal aid programs. Significantly, President Reagan's Executive Order promotes the goal of self-sufficiency among HBCUs, encourages the involvement of the private sector to support HBCUs, and calls on the Presidents of HBCUs to comment on Federal agency plans.

The Federal roles and responsibilities relative to the higher education of Blacks was extensively investigated by Leonard H. O. Spearman.[5] He contends that Federal efforts have been geared toward counteracting the historical effects of racial inequality and discrimination.

During the period between 1967 and 1981, HBCUs had minimal sharing in the massive supports for institutions of higher education. The Federal role, he states, can best be described as "a holding action" of sorts, designed to placate and mollify the institutional representations and the political considerations associated with this vital subject. Further, judicial interventions were seen by Spearman to maintain the existence, though not necessarily the integrity

of, Black institutions. He identified the following major research and development programs available to HBCUs:

- The Minority Research Program of the National Aeronautics and Space Administration
- The Minority Institution Science Improvement Program (MISIP)
- The Minority Access to Research Careers (MARC) in the Public Health Service of the U. S. Department of Health and Human Services
- The Minority Institutions Research Support Programs (MIRS) of the Environmental Protection Agency

Spearman's critical analysis of Federal roles and responsibilities relative to Black higher education points out that, for the most part, programs have been symbolic and infinitesmal in comparison to the monies which have been available to majority institutions. Further evidence to support this contention can be found in the Annual Reports of the Federal Interagency Committee on Education, as well as reports from other competent monitors of government allocations to Black higher education institutions. In fact, data for the period 1971 to 1978 reveal that Black institutions received less than 0.85 percent of the total $3.36 billion awarded by the Federal Government to American colleges and universities for research and development activities.[6]

Although most American colleges and universities are largely designed for undergraduate instruction, the Federal Government has had a tremendous impact on increasing

university research capabilities. The Federal Government began funding scientific research within universities on a grand scale during World War II and basically continued the practice afterward. Even before the vast, post-Sputnik expansion of Federal research support, the volume of research funding available to universities had attained impressive levels; moreover, it was concentrated at institutions of proven excellence.

R. L. Geiger, in his recent article on the "Role of Organized Research Units in the Development of University Research," points out that the most distinctive feature of American research funding was the elaborate systems of peer review of research proposals operated by the Federal Government--principally the National Science Foundation and the National Institutes of Health. This expert control, he states, played a powerful role in assuring that the resources for science were channeled into the hands of the most capable and most entrepreneurial investigators.[7]

It is within this context that HBCUs and their associations have voiced strong criticisms. For instance, Leonard H. O. Spearman states:

> Black colleges themselves have contended that the Federal decision-making processes affecting them should include more of their inputs. As a matter of fact, they have banded themselves together in a consortium which, following the pattern of conventional circumlocution and euphemism, calls itself the National Association for Equal Opportunity in Higher Education.[8]

He goes on to say that Federal subsidies directly available to Black higher institutions have been chiefly in the "softer" areas of fund allocations--health, housing, transportation, education, etc.--and in amounts and for purposes which have operated to prolong the status of these institutions as Federal dependents. The exception is Howard University, which has received annual escalating appropriations from the United States Congress since 1875. Howard University and Meharry Medical College are frequently excluded from analysis of HBCU participation levels in Federal grants because their revenues are markedly higher than other Black institutions.

Statement of the Problem

There is serious concern about the quality of science instruction and research opportunities available to minority students enrolled at historically Black colleges and universities. John H. Hall of Atlanta University Center, Inc., reported in 1984 that the underrepresentation of minorities in science is a grave problem, destined to become critical if definitive and effective measures are not immediately taken.[9] Labor market indicators suggest that the impact of technology is more evident now than ever. For instance, the decisions to be made in the environmental sciences, in biochemistry, and in computer

technology have as much impelling social effect as scientific significance.

Statistics reported by the National Science Foundation illustrate the severity of the problem: Black Americans make up only 4.1 percent of all B.A. degrees, 2.5 percent of all M.A. degrees, and 1.7 percent of all Ph.D. degrees in the physical sciences, mathematics, computer sciences, biological sciences, engineering sciences, and economics.[10] On the other hand, Black Americans are overrepresented in certain non-science disciplines. For the period 1979-1980, only two percent of all Ph.D. degrees awarded to Blacks were in the quantitatively-based disciplines, while 55 percent of all Ph.D. degrees awarded to Blacks were in education. Comparatively for the same period, 29 percent of all Ph.D. degrees awarded to Whites were in the quantitatively-based disciplines and 25 percent were in education.

Michael T. Nettles contends that the underrepresentation of minorities is symptomatic of the continuing inequality of educational opportunities for ethnic minority groups, even after several years of effort to eliminate legal exclusion.[11] In addressing institutional characteristics and participation in science curricula, Nettles acknowledged that Black institutions have played a key role in the careers of Black scientists. Although HBCUs are important in the production and employment of minority

scientists, they have historically received only a small fraction of the Federal support for research and development activities, and this fraction has declined in recent years. Other researchers who have explored the issue of underrepresentation of minorities in science and engineering have reported only small differences in the percentages choosing science fields as probable majors.[12]

Clearly, these statistics demonstrate that minorities are significantly underrepresented in science and technology at every educational level. In order to ensure representational training, it is necessary that HBCUs be provided opportunities to increase their institutional capacity to offer quality science and technology education in an academic research atmosphere.

Historically, historically Black colleges and universities have trained, and continue to train, a significant percentage of minority scientists and precollege teachers who work with large numbers of minority students. These institutions, therefore, are in a central position to have an impact on the science training of minority precollege students.

Because of the prestige research and development activities bring to colleges and universities, most colleges have attempted to develop competitive research programs that attract sizable amounts of external funds and bring prestige to their institution. A review of Federal research and

development grant and contract awards revealed that of the more than 3,000 institutions of higher education in the United States, about 120 (or four percent) handle more than 90 percent of all organized university research.[13]

Clearly within a competitive environment, there are internal and external barriers to achieving the goal of a research and development university grant or contract. This study operates from the premise that these barriers adversely impact HBCUs to a greater extent than the majority of institutions. One overriding circumstance is the fact that no HBCU was organized with the fundamental idea of furthering the state of knowledge of mankind. Rather, they were defined as institutions where Black people could begin receiving advanced education--a teaching orientation rather than a research orientation.

It is for this reason that the Federal Government has included in its HBCU Initiative a support system designed to assist them in building their infrastructure to support an institutional research program. Such a program also requires research leadership which is critical in the development of a policy and operational infrastructure that supports improved research programs.

The foregoing predicates the basic problem of this study: There is little evidence that the research goals of the Federal Initiatives have significantly impacted the capacity of HBCUs to expand their research programs and

decrease the underrepresentation of minorities in science and technology during the past ten years. The primary thesis of this study is that it is feasible to utilize a particular methodology for measuring the growth and stability of research programs in science and technology at HBCUs. The proposed methodology used the proportion of HBCUs who actually participate in Federal programs designed to strengthen their research and technology capacity, their success in winning competitive research grants and contracts, and increases in the number of graduates in the quantitatively-based disciplines as measures of growth and stability.

If the evaluation methodology is to be usable, it must first establish that differences in the manner in which Federally-sponsored programs are configured really affect the decision and the ability of HBCUs to participate. In developing these relationships, it is necessary to separate the effects of the configuration of the Federal programs from the historical environment and leadership effects of HBCUs. The proposed study is not a treatment of the evaluation methodology but a test of the strengths and separability of those variables thought most to affect the types and level of participation among HBCUs.

In fact, it is more useful in explaining variation in HBCU participation levels to prove the separability and testability of key factors than to prove that particular

relationships can be predicted from the efforts. Therefore, the proposed study will isolate key factors related to participation levels and attempt to establish separability or non-separability, in order to lead researchers, planners, and policymakers in the direction of more careful use of assumptions about the nature of HBCU participation levels in Federally-sponsored programs designed to strengthen their research and technology capacity.

Primary Questions

This study, therefore, will address the following major research questions:

1. Have Federal programs in science and technology been implemented in such a manner as to strengthen the research opportunities and academic programs at historically Black colleges and universities during the period 1979-1989?
2. If so, in what ways have historically Black colleges and universities gained access to Federal funds and support mechanisms?

Implementing Questions

In an attempt to provide answers to the primary research questions, the following subquestions will be addressed in the evaluative analysis:

1. What types of Federal science and technology programs are available to strengthen the research opportunities and academic programs at historically Black colleges and universities?
2. How are these programs administered and what methods of outreach are utilized to inform historically Black colleges and universities?
3. What are the predisposing characteristics of the participating historically Black colleges and universities:

- Size Characteristics (student enrollment)
- Faculty Size and Characteristics (tenure, Ph.D. degrees, etc.)
- Type of Majors and Curriculum Concentrations
- Level of Degrees Offered
- Type of Control (public vs. private)
- Admission Criteria
- Number of Degrees Awarded in the Quantitatively-Based Disciplines
- Mission

4. What types of facilitating factors are related to historically Black colleges' and universities' growth and stability which are a consequence of HBCU leadership:

   - Pattern of leadership among HBCUs
   - Formalized industry connections
   - Access to special facilities
   - Computer/science/technology laboratories
   - Change in the institution's mission during the eight-year period

Purpose of the Study

The primary objective of this study is to evaluate factors related to historically Black colleges' and universities' participation levels in Federally-sponsored science and technology programs. These factors are believed to be either aspects of individual institutions, their environment, their control authority, leadership quality of policymakers, or features of the configuration of the Federally-sponsored programs. It is important that these factors be distinguished because the Federal Government can probably only address itself to those institutions who self-elect to participate. Those factors which are characteristic of HBCU

policymakers and administrators will have to be changed by developments within other systems or through a larger system outlook.

A second objective is to provide insights on policy issues relating to the benefits of certain configurational alternatives. Within each of the participating Federal agencies, HBCU programs are uniquely structured. Such a practice led the National Association for Equal Opportunity in Higher Education (NAFEO) to make specific recommendations as to how the HBCU system supports could be configured and their function.[14] In a report by its National Advisory Committee, six system support areas were identified and discussed: (1) Federal Policy Toward Black Colleges, (2) Research, (3) Human Resources, (4) Socioeconomic Issues, (5) Planning, and (6) Monitoring and Evaluation.[15]

The important aspect of this study is to explore the separability and testability of the identified factors in HBCU particiaption levels in Federal science and technology programs. Such an approach will lead researchers and planners in the direction of more careful use of assumptions about the nature of HBCU participation.

Significance of the Study

A review of the literature revealed that there can be little controversy among educators as to the importance and

significance of a study on the impact of Federal funds on strengthening the research opportunities and programs in science and technology at historically Black colleges and universities.

The primary significance of this study is its attempt to analyze the impact of a source of funding from the Federal Government designed to increase access to research opportunities and in making improvements in quantitatively-based disciplines. Given the opportunity to improve the curriculum in an academic research environment with the aid of Federal funds will contribute to closing the high technology gap between the majority institutions and minority institutions. It is hoped that the findings from this study will be helpful to historically Black colleges and universities as well as to the Federal Government in removing the barriers to the institutional pursuit of competitive research programs.

Definition of Terms

The following terms will be used throughout this research study:

Executive Order 12320:	A presidential mandate which required Federal agencies to submit to the Secretary of Education an Annual Performance

Report which describes the agency's efforts in the preceding fiscal year to provide assistance to historically Black colleges and universities.

Facilitating Factors of HBCUs: Functions which guide the behavior of individuals, groups, or units in a college or university toward providing quality education and adapting to changing times within the larger society. A key component of the facilitating is leadership.

Formalized Industry Connection: Formalized ties or cooperative agreements with private industry or other institutions of higher learning relating to research endeavors and student/faculty training opportunities.

Governance: Both the structure and the process of decision-making related to institutional mission, strategy, purposes, and policy. Further, it refers to major external actors or structures affecting decision processes and major

internal institutional governance structures, such as governing boards, senates and unions, decision-making, and planning processes.

Historically Black Colleges and Universities (HBCUs): Institutions that were founded primarily for Black Americans, although their charters were, in most instances, not exclusionary. They are institutions serving or identified with service to Black Americans for at least two decades, with most being 50 to 100 years old.[16]

Leadership: The structures and processes through which individuals seek to influence decisions, as well as the process for implementing and executing decisions; in this instance, decisions related to participation in Federal science and technology programs. P. Hersey and K. H. Blanchard define leadership as the process of influencing the activities of an individual or a group in

efforts toward goal achievement in a given situation.[18]

Mission: The self-imposed purpose of the academic institution which is predominantly reflected in the curriculum, type, and level of degrees awarded.

Predisposing Characteristics of HBCUs: Descriptive indicators of educational institutions. Most of the indicators are self-explanatory.

Research and Development: Research is the "systematic and intensive" study directed toward a fuller knowledge of the subject studied, whereas Development is use of that knowledge directed toward the production of useful materials, devices, systems, methods, or processes. Basic Research was defined in the U. S. Department of Defense, Directive No. 3210 (November 12, 1957), as: "That type of research which is directed toward increase of knowledge of science. It is research where the primary aim of the

investigator is a fuller knowledge or understanding of the subject under study."[17]

Universities: Defined by the U. S. Department of Education, National Center for Education Statistics, as institutions that place considerable emphasis on graduate instruction, confer advanced degrees, and have at least two professional schools that are not exclusively technological. The advanced degrees must constitute at least 20 percent of all degrees conferred. Of this percentage, degrees in education can qualify only if they do not constitute the bulk of all advanced degrees conferred. The fact that many HBCUs are oriented toward industrial training or teacher preparation is among the factors precluding their classification as universities.

End Notes

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C H A P T E R II

REVIEW OF THE LITERATURE

Introduction

The empirical literature review addresses the key issues raised in the problem statement and provides a context for the decision to focus on the participation levels of historically Black colleges and universities (HBCUs) in Federal science and technology programs. The literature documents the fact that minorities are significantly underrepresented in science at every educational level and are not participating fully in science policy discussions and decisions. On the one hand, the underrepresentation rates can be said to be a function of the lack of emphasis on science and mathematics at the secondary level in spite of efforts at educational reform. On the other hand, the underrepresentation rates are seen as a consequence of the traditional mission of HBCUs, which is heavily loaded toward a liberal arts focus. However, there is serious concern about both science instruction and research opportunities available to underrepresented minority students, particularly those enrolled in predominantly Black institutions. Specific questions of interest which guided the literature search are:

1. What is known about factors that lead to lower participation rates among minority students, especially Blacks, in science and technology?
2. What is known about factors which lead to the underrepresentation of historically Black colleges and universities (HBCUs) in Federally-sponsored research, education, and training in science and technology?

Determinants of Minority Student Participation in Science and Technology

The National Research Council concluded that the number of minority students earning science and engineering degrees is a function of both their persistence in higher education and their choice of science and engineering majors.[1] Other researchers have suggested a number of factors as correlates of the low rate of minority participation in science and technology and the high rate of attribution among those minority students who initially entered those fields. Some of these factors are family background, academic preparation, and college characteristics. Others have tended to focus on cultural factors, career information, and interpersonal influences.

The Office of Technology Assessment contends that one of the major determinants of underrepresentation in science and engineering is deficiencies in academic preparation.[2] Two separate panels of educational experts identified the lack of academic preparation as one of the most important factors deterring minorities from participation in science and engineering curricula.[3]

Findings from quantitative assessments support the views of these educators. For instance, George H. Dunteman, Joseph Wisenbaker, and Mary Ellen Taylor found that differences in ability and academic background distinguished the science majors from non-science majors.[4] Alexander W. Astin reported that students with the highest S.A.T. scores tended to prefer majors in the sciences, and he suggested that the underrepresentation of minorities in the sciences was in part due to poor academic preparation at the secondary level.[5] Sue E. Berryman also found that the students who planned to major in the sciences had higher scores on the quantitative portion of the S.A.T. than students planning to major in other fields.[6]

According to the National Science Foundation, when it comes to training for the quantitative fields, there are large differences in the preparation of minority and non-minority students.[7] Their data show that among the 1983 freshmen with probable majors in mathematics, 80.2 percent of the White students had four or more years of high school

mathematics, while only 60.8 percent of the Blacks planning college majors in mathematics had four or more years of high school mathematics. There were also large disparities in mathematics preparation among the physical science majors.

Further, George H. Dunteman et al. demonstrated the importance of these background differences in the choice of a college major.[8] He concluded that when racial groups are statistically equated on four key intervening variables (mathematics ability, orientation to things, perception of mothers' educational aspirations for children, and number of high school science semesters), there was a substantial positive effect of being Black on the choice of science majors. He further states that these intervening factors accounted for the negative relationship between being Black and being a science major.

Most of the research and commentary on precollege factors have focused on academic background. However, researchers have also reported an important relationship between socioeconomic background and the choice of a science major in college. Again, Dunteman et al. found differences between the socioeconomic status of the families of science majors and other majors.[9] Similarly, Sue E. Berryman found that having a college-educated parent not only increased the likelihood of choosing a quantitative major, but equalized the rate of choice across White, Black, American Indian, and Hispanic subgroups.[10] At least part of

the relationship between parental educational level and college major was due to the effects of parental education on students' high school performance and postsecondary education plans. These observations led Berryman to hypothesize that parents with college experience were more likely to assume that their children would attend college and also know more about the early training investments that their children needed to make. She also postulated that the second-generation college students were more likely to have grown up with knowledge of wider occupational horizons than first-generation college students.

Several studies have stressed the importance of role models for increasing the number of minority scientists and professions. Lucy P. Murphy and E. Wesley McNair observed that minority science students acknowledge the importance of mentors and role models in their field choice.[11] Howard H. Garrison and Prudence W. Brown observed that mentors are important in minority students' persistence in science careers.[12]

Another factor found to correlate with minority underrepresentation rates in science is childhood exposure to scientists. Gail E. Thomas found that both Black and White students majoring in the sciences are more likely to have had childhood exposure to scientists than were students majoring in other fields.[13] The race of the role model was also seen as very important. When asked about the person

who most influenced their choice of a college major, approximately 90 percent of the Black respondents and nearly 98 percent of the White respondents reported a person of the same race.

While the relationship between mentors and field choice is well documented, less is known about the underlying dynamics of the association. The role models may serve as sources of occupational information. Therefore, it appears that inadequate career information is a major cause of minority underrepresentation in college science programs.

Identification with the field through identification with the mentor may also be an important process of choosing a scientific career. Minority students participating in an honors training program reported that the opportunity to see members of their own ethnic group working as scientists was a very important factor in the decision to pursue a science career.[14] This observation led Howard H. Garrison and Prudence W. Brown to conclude that the experience helped to demystify the life of the researcher and helped students to envision themselves in research careers.[15] On the other hand, part of the mentors' impact on the careers of their students may involve more than psychological dynamics. For instance, James E. Blackwell contended that the importance of personal references in academia tends to work against minority students, especially those from minority institutions.[16]

Other studies have addressed the impact of institutional characteristics on minority participation in science and technology. It is generally agreed that while the effects of institutional characteristics on general persistence in higher education are neither large nor uniform across all studies, there does appear to be important reasons to reexamine institutional effects of field choice. Historically Black colleges and universities (HBCUs) vary in their ability to offer certain technical curricula (e.g., engineering), and departmental strengths and weaknesses may affect field choice in much more direct ways than other institutional characteristics influence general persistence in higher education.

A number of observers have pointed out the historically important role that traditionally Black institutions have played in the careers of Black scientists.[17] As early as 1977, Zora L. Griffo reported that 62 percent of all Black M.D.s and 72 percent of all Black Ph.D.s in science received their undergraduate education at Black institutions.[18] Further, it was reported that the HBCUs employed between 65 percent to 75 percent of the academically employed Black science doctorates.

Later research on the percentage of Black students earning bachelor's degrees revealed that a larger percentage of Black bachelor's degree recipients were biological science majors at Black institutions than at White

institutions.[19] A year earlier, William T. Trent found that in a number of science and engineering fields (biological sciences, computer science, engineering, mathematics, and physical sciences), predominantly Black colleges produce a greater share of the Black bachelor's degrees than their share of all degrees would predict.[20] Trent went on to report that from 1976 to 1981, the position of Black institutions improved relative to the White institutions in terms of the percentage of Black degree earners with majors in these science and engineering fields. These findings, however, must be considered tentative because the analyses were not able to control for differences in the characteristics of the students attending each type of school.

These studies tend to suggest that Black underrepresentation in science and technology is not as great a problem at the undergraduate level as it is at the graduate level. Sue E. Berryman contends that some of this increased disparity is the result of lower rates of matriculation in graduate school.[21] She observed that Blacks earned 5.5 percent of the bachelor's degrees in science and engineering. Similarly, the National Science Foundation reported in 1985 that Blacks make up only 3.7 percent of the citizens in the United States enrolled as full-time students in science and engineering.[22]

Aspirations for advanced degrees are important precursors to graduate enrollments, and measures of ability and

achievement are highly correlated with graduate degree aspirations. Among a sample of Graduate Record Examination (G.R.E.) takers, John A. Centra found that the important predictors of aspiration for a doctorate rather than a master's degree were Graduate Record Examination scores and college Grade Point Average (G.P.A.).[23] Further, he asserts that being male and Black are associated with higher aspirations once the other measures are controlled.

Helen S. Astin and Patricia H. Cross reported that Blacks in Black undergraduate institutions tended to aspire to Ph.D. and Ed.D. degrees more often than Black students at White undergraduate institutions. However, Black students at White institutions were more likely to aspire to professional degrees.[24] Conversely, John A. Centra found that when race, sex, G.P.A., and G.R.E. scores are controlled, undergraduates from Black institutions and women's colleges had slightly lower graduate degree aspirations.[25] However, the attributes of individuals were much stronger predictors of graduate school plans than the institutional characteristics. These findings tend to suggest that individual characteristics versus institutional characteristics may be a function of the intellectual climate at certain schools that fostered the motivation for advanced training, or else that prestigious undergraduate institutions have better connections to graduate and professional schools. Thus, it is concluded that underrepresentation of minorities in

college science and technology programs is the result of racial differences in rates of participation in higher education and racial differences in field choices. Expanding opportunities for undergraduate students to participate in research would introduce more students to the challenges and excitement of scientific inquiry. Additionally, both the quantity and quality of faculty-student interaction are correlated with academic achievement. For minority students, this interaction can best be promoted by the presence of minority faculty members. These minority faculty members serve minority students as mentors and role models, and, in addition, become visible symbols of the institutions' commitment to racial equality.

Determinants of HBCU Participation in Federally-Sponsored Research, Education, and Training in Science and Technology

The introduction to this topic can best be gleaned from the following summary of the Annual Federal Plan for Assistance to historically Black colleges and universities for fiscal year 1986.[26] In an address by David Cummings on "Strategies for HBCU Research Enhancement," a succinct description was provided on the research environment at HBCUs.[27] The context of his remarks relate to one of the requirements of President Ronald Reagan's directives under Executive Order 12320, which provides the opportunity for

presidents or chancellors of HBCUs to comment on the proposed annual plan before it is submitted to the White House.

> Among the most strongly voiced comments proffered by the respondents concerned the critical issue of the impact that the increasing prominence of science and technology has on the small liberal arts undergraduate institutions, which is the profile of the typical HBCU. These administrative officials were concerned that these two areas will be the primary foci of most Federal awards. They contend that the traditional mission of their colleges as liberal arts and teacher preparation institutions has not prepared them to be immediately and successfully competitive in the receipt of science and technology awards offered by Federal agencies. An expressed corollary is the perceived increasing concentration of awards at the graduate level, again placing the typical HBCU, an undergraduate institution, at a disadvantage. To address these perceived problems, it was suggested that the Federal agencies could and should provide increased assistance to liberal arts HBCUs to integrate technology into the liberal arts curriculum. . . . This would provide the specialization necessary for such institutions to compete successfully for research grants and contracts (and) would provide for the important preparation of . . . students for graduate and professional schools and careers in the highly technical and scientific fields.[28]

Cummings stated that the concern expressed by the HBCU presidents and chancellors is quite valid.[29] His tenent is that significant research can be done at HBCUs and that student involvement in research is extremely important because it enriches their educational experience and potentially shapes their career choices.

The primary objective of the HBCU Research Seminar conducted at Grambling State University (December 9-10, 1986) was to help enhance the capacity of HBCUs in providing

quality education and to enable them to significantly increase their participation in Federally-sponsored programs.[30] These objectives were achieved by providing a base for mutual interaction and personal dialogue between potential research faculty members at HBCUs, active research project directors at HBCUs, working scientists at national laboratories, and the HBCU research program administrators of Federal agencies.

To facilitate higher levels of HBCU participation in research and development, Cummings and other conference participants strongly encouraged the development of a Minority Institutions Research Association which would be chartered to improve the research environment at these instituions.[31] Specifically, the Research Association would have the following objectives:

1. Disseminate information on Federal research grants/opportunities for faculty and students;
2. Develop a data base of the pool of scientific talent and research facilities at HBCUs;
3. Organize research seminars and workshops on proposal development and priority areas of research of Federal agencies;
4. Organize summer and academic year research institutes for HBCU student and faculty training;

5. Provide help, guidance, and consultation services in the development of viable proposals.

Also, during the HBCU Research Seminar, Philip L. Young and Akundi N. Murty provided an insightful assessment of the current status of HBCU success levels in winning research grants and contracts. They reported:

> Funds received by HBCU undergraduate institutions for academic research have been insignificant. Notwithstanding the fact that there is a large number of trained research faculty in these institutions, their success in procuring grants for research has not been encouraging. Their proposals generally fail in the overall competition for research funds. This is, in part, because beginning researchers at HBCUs fail to align their talents and interests with guidelines, goals, and priorities of sponsoring agencies.[32]

A second avenue which was explored to isolate determinants of HBCU participation in Federally-sponsored research, education, and training in science and technology is the Government-University-Industry Research Roundtable's publication, New Alliances and Partnerships in American Science and Engineering. The Research Roundtable was created in 1984 to provide a forum where scientists, engineers, administrators, and policymakers from government, university, and industry can come together on an ongoing basis to explore ways to improve the productivity of the nation's research enterprise. It operates under the auspices of the National Academies of Sciences and Engineering, and the Institute of Medicine. Their concept of "New Alliances"

refers to the joint ventures and cooperative relationships between universities and small and large companies, the financial community, and state and federal governments.[33]

This monograph detailed 11 university-industry alliances based on available literature and discussion sessions with representatives of the programs, and 10 university-industry alliances based exclusively on available literature. David Noble[34] and Henry Etzkowitz[35] tend to agree that university-industry alliances have recognizable antecedents that go back in time. Since many fields of science have traditionally been strongly applications-oriented, and teaching in these fields has for the most part been preparation for industrial careers, the "Alliances" seem to be a natural outcome. This should be particularly true for land-grant colleges and universities, put into place to train common citizens in the agricultural and mechanical arts. Many HBCUs were established as land-grant colleges and therefore should be presumed to be likely candidates for university-industry alliances, especially in agricultural and mechanical arts. However, this is not the case. A strain of research universities grew up as "technical schools" and are now the great engineering-oriented universities, e.g., the Massachusetts Institute of Technology, Rensselaer Polytechnic Institute, California Institute of Technology, and Georgia Institute of Technology.[36] These institutions were the recipients of

private foundation funds to support their research enterprise. According to Harvey Brooks, funding for research increased dramatically after World War II. The Federal Government became the dominant external source of research funding at the universities. At the same time, industrial support for these institutions also grew. Brooks further states that this arrangement reinforced university values calling for distance from business interests--government funds were often justified by the argument that focused academic science was the key to practical progress.[37]

Donald Kennedy explains the alliances between academic enterprise and business as responding to the needs for stable research funding patterns.[38] For instance, during the 1970s, universities became increasingly aware that in many fields, the cost of doing research was growing at the same time that Federal support was in danger of decline.[39] Thus it was seen as a natural progression for university administrators and researchers to be drawn to industry. The President's Commission on Industrial Competitiveness reported that at least two areas of cutting-edge technology--computers and biotechnology--were recognized as closely linked to academic science.[40] The report also stated that it is noteworthy that a non-trivial fraction of the new university-industry arrangements are involved in these two fields.

While there has been a long history of interaction between universities and industry, HBCUs' limited infrastructure and lack of a sufficient number of Ph.D. scientists have excluded them to a significant extent. While there are a number of HBCUs involved in collaborations with industry, they tend to be small in scope and are generally focused on training/internships for graduate students and faculty. More will be said about HBCU industry alliances and collaborations in Chapter VI, Data Analysis, of this study.

Perhaps the greatest number of determinants of HBCU participation in Federally-sponsored research, education, and training in science and technology were identified by HBCU administrators at a conference sponsored by the National Science Foundation in 1984.[41] In a section entitled "Barriers to the Development of Competitive Research Programs," some very interesting perspectives were put forward.[42] It was acknowledged that minority institutions of higher learning have both internal and external barriers which prevent them from achieving the goal of success in developing competitive research programs. External barriers to the institutional pursuit of competitive research programs revolve around the perception of the community about the intellectual capability of a given institution. According to the report, if the external community believes that a particular institution is outstanding, they will then play a significant role in confirming that belief. By the same

token, if the external community believes that an institution is inferior, they can hasten its decline in inferiority. Therefore, proposals submitted by institutions perceived to be inferior are more critically scrutinized.

Internal barriers, according to the Report, may be perceptual as well as organizational. First, it is noted that the mission of HBCUs is related to teaching rather than research. In order for HBCUs to begin to perceive themselves as research institutions, they must overcome the natural conflict resulting from a change in focus. Secondly, organizational problems have developed at the teaching institutions which are not appropriate for a research institution. The point was made that effective research institutions have not only outstanding faculty and students but responsive administrators. The implication is that responsive administrators will have as a primary goal the provision of needed resources to pursue new knowledge. The lack of needed resources (mission, personnel, laboratories and equipment, and leadership) are identified as primary barriers to HBCU participation in Federally-sponsored research, education, and training in science and technology.

The next barrier to building institutional research programs was identified in the "Proceedings" as limited or insufficient infrastructure support functions. The authors identified examples of typical support functions:

- Proposal preparation, delivery, contract or grant development, and establishment of fiscal and technical information and accountability
- Procurement, delivery, installation, and operation of equipment
- Effort reporting and accountability
- Fiscal reporting and accountability
- Management and administrative support
- Space and facilities
- Subcontracting and cooperative agreements
- Photographic and reproduction facilities
- Hazardous waste disposal
- Instrument calibration
- Electronic repair
- Computer support
- Travel
- Animal care
- Laboratory certification
- Inventory system
- Safety procedures
- Security

The next factor related to barriers to HBCU participation in Federally-sponsored science and technology programs is "Leadership". The Report stated that research functions are heavily influenced by policies dealing with tenure, hiring, budget, space, students, sabbatical leaves, financial resources, decision processes, and overall attitude and

environment. It was suggested that most HBCU faculty will not develop research programs if the department head is not encouraging and supportive. Frequently, research program needs and instructional program needs are in conflict and competition. Good instructional research leadership was defined as critical in the development of a policy and operational infrastructure that support improved research programs at HBCUs.

The last barrier identified in the Report was "Programmatic Thrust". The conference participants tended to agree that in order for a successful research program to be developed at minority institutions, there must be a significant overlap between the mission of the funding agency and the research interests and strengths of the faculty. The point was made that faculty at minority institutions have had more success than their majority counterparts in producing highly qualified minority scientists. However, there was consensus among the group regarding the need for young minority scientists and engineers to be trained in a competitive research atmosphere. It may be somewhat safe to say that HBCU scientists and administrators recognize their strength in capturing the scientific ability of students, although with limited support. There is at least the suggestion that with added support from the Federal Government, HBCUs can better prepare minorities at the undergraduate level for graduate training at majority institutions.

These observations tend to support the findings from an earlier study by the National Advisory Committee on Black Higher Education and Black Colleges and Universities. This report addressed needed system supports for achieving higher education equity for Black Americans.[43] This report assumes that the Black colleges and Black higher education are a part of a dynamic system, including several essential supportive structures which will ultimately result in upgrading the level of the economic, social, and political life of Black Americans--providing adequate structures are in place and interacting to their advantage. However, the National Advisory Committee asserts that the present state of these structures is not encouraging. This observation is buttressed by a statement from the National Association for Equal Opportunity in Higher Education (NAFEO):

> We boldly propose that the Federal Government recognize the historically Black colleges as the major architects of equal opportunity with attainment and productivity. The Federal Government should then recognize a special responsibility for strengthening and further development of these colleges. We further, then, propose that in addition to such strengthening, the Federal Government develop a leadership partnership with the historically Black colleges for the purpose of achieving parity in all areas of higher education, and parity in all professional and technical fields in the work force. In concert with the Federal Government, a 25 year plan for Black Americans should be developed.[44]

The National Advisory Committee advances the argument, as does NAFEO that "the historically Black colleges have been and still are a major instrument of racial progress in

America." Therefore, HBCUs generally are deserving of the intervention and support of the Federal Government in assuring their survival. The Report goes on to say that the "HBCUs have assumed the major part of the responsibility for a major Federal policy effort without the ensuing budgetary and policy supports." The HBCU argument is that had the Federal Government been equitable in its dealings with Black colleges, then certain national system supports and national objectives would have been clearly identified which would have provided the HBCUs with a viable support system to assure their effectiveness and viability.

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C H A P T E R III

THEORETICAL FRAMEWORK FOR THE STUDY: LEADERSHIP THEORY

Introduction

Numerous classification systems have been used by scholars in an attempt to categorize the various theories of leadership. According to L. L. Cunningham and W. J. Gephart, there are four major approaches to the study of leadership: (1) great man; (2) trait; (3) behavioral; and (4) situational.[1] R. M. Stogdill identified six approaches to the study of leadership.[2] These approaches are: (1) great man theories; (2) environmental theories; (3) personal-situational theories; (4) interactional-expectation theories; (5) humanistic theories; and (6) exchange theories. A discussion of theoretical approaches to leadership by B. Kellerman is conducted with a framework of trait, behavioral, and contingency theories of leadership.[3]

The Trait Approach

The earliest research on leadership focused on psychology in an attempt to discover what made a successful leader. For many years, the common approach to the study of leadership concentrated on leadership traits proceeded

from the premise that, somehow, those who became were different from those who remained followers. The objective of the research was to identify specifically what unique characteristics of the individual were essential for effective leadership. Researchers began an exhaustive search to identify biographical, personality, emotional, intellectual, and physical characteristics of successful leaders. The literature tends to define this approach to the study of leadership as being largely based upon the common recognition that an individual's behavior is determined in part by his or her unique personality structure. That is, what a person is may be fully as significant a behavioral determinant as what he or she is expected to do.

Such an approach appeared to be plausible since personal qualities or traits can be isolated, modified, and tested, thus making the identification and selection of administrators a relatively simple process. This led to the development of instruments capable of assessing which person or persons had the necessary characteristics. However, the trait approach was limited in its ability to produce equally effective leaders. Subsequent researchers and theorists could not find a single trait which would distinguish a leader from a follower. G. L. Lippitt found, in reviewing over 150 leadership studies, that only five percent of the traits appeared in four or more of the studies.[4]

During the 1970s, D. E. McFarland identified three major weaknesses of the trait theory.[5] First was its failure to consider the influence of situational factors in leadership. He stated that leadership could not be understood apart from its relationship to groups as well as to individuals. Secondly, it had not been possible to isolate and identify specific traits that were common to all leaders. Thirdly, the degree to which managers possess given traits proved hard to measure and predict.

The inherent flaw in the trait theory is that it views leadership as merely being a one-dimensional process. W. G. Scott and T. R. Mitchell conceded the many theoretical, methodological, and practical problems with which the trait approach was confronted.[6] After extensive study across a number of situations, they concluded that traits do not consistently distinguish the leader from the followers or the good leaders from the poor ones. It appears then that traits do not identify the behavioral patterns exhibited by leaders when attempting to influence a subordinate's actions.

The Behavioral Approach

Dissatisfaction with the trait approach to leadership led behavioral scientists to focus their attention on the actual leader behavior; i.e., what the leader does and how

he or she does it. The foundation for the behavioral approach was the belief that effective leaders utilized a particular style to lead individuals and groups to achieving certain goals, resulting in high productivity and morale. Unlike the trait approach theories, the behavioral approach focused on leader effectiveness rather than the emergence of an individual as a leader. This school of thought tended to view leadership styles from the perspective of tasks or the relationships of groups.

Several major research efforts were directed toward investigating determinants of the behavioral approach to leadership. One of the most widely known was conducted after World War II by Ohio State University investigators. The overall objective of the Ohio State University studies was to investigate the determinants of leader behavior and to determine the effects of leadership style on work-group performance and satisfaction.[7] This investigation resulted in a two-factor theory of leadership. Two independent leadership factors referred to as "Initiating Structure" and "Consideration" were identified. A. W. Halpin defined these concepts as follows: "Consideration" refers to behavior indicative of friendship, mutual trust, respect, and warmth in the relationship between the leader and the members of the group; "Initiating Structure" refers to the leader's behavior in delineating the relationship between himself or herself and the members of his or her group, and

in endeavoring to establish well-defined patterns of organizations, channels of communication, and ways of getting the job done.[8]

Halpin saw these two dimensions as two separate and distinct dimensions. The behavior of the leader can be described as any mix of both dimensions and still effective depending on the situation. It was during these studies that leader behavior was first plotted on two separate axes, rather than on a simple continuum resulting in four quadrants to show various combinations of the two concepts. The Leadership Opinion Questionnaire was developed to measure these two dimensions of leadership style.

Additional dimensions of leader behavior were identified by the Ohio State University researchers: representation, demand reconciliation, tolerance of uncertainty, persuasiveness, tolerance of freedom, role assumption, production emphasis, predictive accuracy, integration, and superior orientation. The Ohio State University studies focused on how a leader operates. These studies were the first to point out the importance of goal-directed behavior and the recognition of the individual needs in leader behavior.

Concurrent with the Ohio State University studies were a series of leadership studies in progress at the University of Michigan. The primary objective of most of the studies from the Institute for Social Research at the University of

Michigan was to identify styles of leadership behavior that resulted in increased work-group performance and satisfaction. Primary among this group of research was the work done by Renis Likert.[9] From his studies, two distinct styles of leadership were developed: job-centered and employee-centered orientations. Within this conceptualization, a leader who stresses the relationship aspects of the job is described as employee-centered, while the job-centered leader emphasizes production and the technical aspects of the job.

Earlier, Likert published the results of his research at the University of Michigan and expanded the patterns of leadership or management employed at a particular organization to include four styles: exploitative authoritative, benevolent authoritative, consultative, and participative leadership. The participative manager, who gives some direction but allows decisions to be made by consensus and majority based on total participation, is seen as the most effective style of leadership.

R. R. Black and J. S. Moulton used the same basic task accomplishment and personal relationships concept in their development of the Managerial Grid.[10] This Grid utilizes the two dimensions of concern for people and concern for production with the four quadrant aspect as in the Ohio State University studies. These authors assumed that people and production concerns are complementary, rather than

mutually exclusive. Five basic styles of management were identified: (1) impoverished; (2) country club; (3) task; (4) middle-of-the-road; and (5) team--with team management preferred by combining a high degree of concern for production with a high degree of concern for people.

Also from the Institute of Social Research at the University of Michigan, D. G. Bowers and S. E. Seashore developed the Four-Factor Theory of Leadership.[11] Their contention is that leadership behavior involves more than two dimensions; in fact, it involves the four dimensions of support, interaction facilitation, group emphasis, and work facilitation. Like the previous studies, concern with relating leadership styles to measures of satisfaction and performance was primary. While the behavioral approach contributed to the body of knowledge on leadership, it did not substantially expand the approaches developed by the trait theorists.

The Situational Approach

During the late 1960s, researchers recognized the limitations of the trait and behavioral approaches to the study of leadership, and tended to move into the direction of particular situations in defining leader behavior. One of the first situational models of leadership was developed by F. E. Feidler and is known as the Contingency Theory of

Leadership Effectiveness.[12] He hypothesized that the situation as well as the personality or traits of the leader and the makeup of the group were configured in such a way that one was contingent on the other. His theory states that the appropriateness of the leadership style for maximizing group performance is contingent on the favorableness of the group-task situation. Four factors of leadership serve as the framework of the model: (1) style assessment; (2) task structure; (3) group atmosphere; and (4) the leader's position power. This model suggests that leadership effectiveness is a function of the leader's motivational base and the interaction of situational factors. Further leaders are seen as either task-oriented or employee-oriented, implying that leadership is essentially a unidimensional concept.

During the early 1970s, a second situational theory of leadership was advanced by R. J. House.[13] In his path-goal theory of leader effectiveness, the role of the leader in eliciting goal-directed behavior consists of increasing personal payoffs to subordinates for work-goal attainment, and making the path to these payoffs easier to travel by clarifying them, reducing roadblocks and pitfalls, and increasing the opportunties for personal satisfaction en route.

The four styles of leadership in the path-goal model are instrumental, supportive, participative, and

achievement-oriented behavior. The theory posits that these four styles can be exhibited by the same leader in various situations and that the effectiveness of the leader depends on the situation.

Later during the 1970s, V. H. Vroom and P. Yetton developed a normative decision-making model of leadership which isolates the kinds of situation in which various degrees of participative decision-making would be appropriate.[14] This model emphasizes two criteria for decision effectiveness: quality and acceptance. Procedurally, Vroom and Yetton suggest that leaders perform a diagnosis of the situation and problem by applying a number of decision roles to help determine which decision-making style of leadership is appropriate for the particular situation. By using a careful diagnosis, the leader would minimize the chances of reducing decision quality and acceptance.

Also during the late 1970s, P. Hersey and K. H. Blanchard extended what is known as the life-cycle theory.[15] Accordingly, they contend that as the level of maturity of one's followers increases, appropriate leadership behavior requires less structure on task and less socioemotional support on relationships. The Situational Leadership Theory strongly suggests that leader behavior must change as followers mature.

Further studies continued in their quest for the best style of leadership. P. E. Gates, in collaboration with P. Hersey and K. H. Blanchard, observed that "successful leaders are those who can adapt their behavior to meet the demands of their own unique environment."[16] However, this conclusion left aspiring managers with major unanswered questions. In response to this situation, Hersey and Blanchard developed a Situational Theory of Leadership.[17] This theory provided a framework which could help practicing managers make effective decisions on how various situations should be handled. The theory described a way of diagnosing situations and determining appropriate leadership styles for different classes of situations. According to F. E. Finch, H. R. Jones, and J. A. Litterer, this theory proved to be a useful vehicle for addressing some of the major issues in the area of leadership.[18] On the other hand, Gates and his associates commented that the theory had grown out of earlier leadership models which were based on two kinds of behavior central to the concept of leadership style: task behavior and relationship behavior.

Hersey and Blanchard's Situational Leadership Theory appears to be founded upon an interplay among the following concepts: the amount of direction (task behavior a leader gives); the amount of socioemotional support (relationship behavior) a leader provides; and the maturity

level that followers exhibit on a specific task. In fact, the authors state:

> . . . as the level of maturity of their followers continues to increase in terms of accomplishing a specific task, leaders should begin to reduce their task behavior and increase their relationship behavior. This should be the case until the individual or group reaches a moderate level of maturity. As followers begin to move into an above average level of maturity, it becomes appropriate for leaders to decrease not only task behavior but relationship behavior as well. Now the individual or group is not only mature in terms of the performance of the task but also is psychologically mature.
>
> Since the individual or group can provide their own 'strokes' and reinforcement, a great deal of socioemotional support from the leader is no longer necessary. People at this maturity level see a reduction of close supervision and an increase in delegation by the leader as a positive indication of trust and confidence. Thus, Situational Leadership Theory focuses on the appropriateness of effectiveness of leadership styles according to the task relevant maturity of the followers.[19]

In defining leadership styles, Hersey and Blanchard developed a typology resulting in four basic styles:

(1) High Task/Low Relationship: Defined as 'telling' because it utilizes more one-way communication and role definition by the leader.

(2) High Task/High Relationship: Defined as 'selling' because the leader provides most of the task direction. In this case, the leader uses two-way communication and socioemotional support to get the subordinates to 'buy into' the decision.

(3) High Relationship/Low Task: Defined as 'participating' because as two-way communication increases, the leader becomes the facilitator since the followers have the ability and skills to do the job.

> (4) Low Task/Low Relationship: Defined as 'delegating' because the situation requires less direct and prolonged intervention on the part of the leader since both are willing and able to take responsibility for self-direction with regard to the task at hand.[20]

Effective leadership is the result of the relationship between the leader, the follower, the organization, and the wider environment. It results from accurately assessing the variables and acting accordingly. Effective leadership involves choosing the leadership style appropriate to the situation and utilizing the necessary leadership behaviors.[21] In other words, effective leadership is an act of balance between task and relationships, thinking and feeling, intuiting and sensing, and between involvement and detachment.

Theoretical Determinants of Negro Leadership

This section will attempt to define Black leaders, their role in the changing status of Blacks, and their methods and styles. Since most of the literature on Black leadership is closely aligned with the Black political experience, an attempt will be made to show parallels with leadership in Black institutions of higher learning. Mack Jones states that much of the research on Black leadership in America "proceeds in an atheoretical manner."[22] Consequently, what is needed is the development of some

fundamental categories of a theory of Black leadership and politics in America.

The search for literature on Black leadership revealed an interesting dichotomy--the old "Negro" leadership studies, which dates roughly from 1930 to 1966, and the new "Black" leadership studies, dating from 1966 to the present. It appears that a transformation in Black leadership occurred during the 1960s as a direct result of the civil rights movement.

According to E. Ladd, Negro leaders are considered to be "persons able to make decisions affecting the choice of race objectives and/or the means utilized to attain them."[23] Donald R. Matthews and James Warren Prothro defined Negro leaders as "those persons most often thought of as Negro leaders by Negroes."[24] J. Wilson defined Negro leaders as "civic leaders"--those persons who acted as if the interests of the race or community were their goal.[25] D. Thompson, using what he calls a functional approach, defined a Black leader as an individual who, over some period of time, overtly identifies with the Negro's effort to achieve stated social goals.[26] M. Burgess defined a leader as an individual whose behavior affects patterning of behavior within the Negro community at a given time.[27] R. Smith comments that while agreement on the meaning of Negro leadership is far from universal, a tendency can be discerned among the authors to agree that: (a) leadership involves affecting

the attitudes and behavior of Negroes insofar as social and political goals and/or methods are concerned; and (b) Negro leadership is not limited to Negroes but may and does indeed include Whites.[28] He goes on to say that the available research on leadership in local Negro communities in both the North and South during this early period (1930-1950) indicates that there existed reasonable well-developed power structures and status hierarchies. In the South, the local power structures were usually constituted by a relatively small group of preachers, teachers, undertakers, lodge leaders, and those with light skins. Whereas in the North, the leadership group was constituted by a handful of politicians; a smattering of business and professional men; gamblers and underworld figures; and a larger group of teachers, postal workers, and other lower-level government employees.

Nationally, the leadership was comprised of persons with a more pronounced middle-class character, that is, with considerable educational and professional achievements, and was disproportionately composed of what G. Myrdal called "Negro glamour personalities," such as prominent athletes, entertainers, and other accorded status by the White community.[29]

The literature strongly suggests that the leadership of this period tended to be accommodationists, especially in the South. While in the North, there was evidence of a

rising spirit of protest.[30] A number of observers also characterize the northern wing of the leadership as both conservative and accommodationist.

The civil rights movement confronted not only an entrenched conservative White power structure but also in many communities an entrenched, relatively conservative Negro structure of power. M. Bennett reports that the national structure of Negro power--institutionalized in the executive boards and administrative offices of the leading civil rights organizations, and including the bishops and pastors of the largest and most influential churches; the editors and publishers of major Negro newspapers and periodicals; leading educators, businessmen, and professionals; and important White liberal labor, religious, and philanthropic allies--was also subject to challenge by the young activists of the civil rights movement because "down in the years, the Negro power structure has been more active in accommodating the masses to misery than in organizing them for an attack on the forces responsible for the misery." He describes the Negro leadership of the 1950s as the "Black Puritan Class," that is, the lineal and spiritual descendants of the Antebellum and Reconstruction mulatto upper class.[31]

In terms of social background, the literature revealed that Black leaders are essentially middle-aged and middle-class men. In the South, leadership required that Blacks

have relative economic independence from or invulnerability to Whites. Teachers, who because of their education might have been natural leaders, have been relatively unrepresented in leadership groups because of their vulnerability to the imposition of sanctions by Whites, while the relatively economically independent preachers and businessmen have been disproportionally represented.[32]

It is generally agreed that the Negro church and its leaders, the preacher, play an important role in community leadership.[33] Many leaders during slavery and Reconstruction were ministers. In the south, G. Myrdal found that the preacher was "the typical accommodating leader," while the preacher in the North was more politically and socially active. Myrdal goes on to say that "on the whole even the northern Negro church has remained a conservative institution with its interests directed upon worldly matters, and has largely ignored the practical problems of the Negroes' fate in the world."[34]

Lastly, in exploring the concept of Negro leadership, several studies provide empirical support on the effectiveness of leadership provided by Whites. For example, Myrdal discussed the role of "White interracialists," generally upper-class White persons who are "specialists in becoming fixers and pleaders for Negroes."[35] L. Bennett, noting that "the Black establishment is not all Black," identified important Whites in liberal, labor, religious, and

philanthropic groups as part of the national structure of power in the Negro community.[36] D. Thompson developed the category of "functional Negroes," that is, White persons who identify so completely with Negroes that they are generally regarded as "Negro spokesmen."[37] Further, J. Wilson suggested that success in attaining Negro goals was related to the extent to which there existed powerful White liberal groups, the existence of which "means that it is possible to obtain action on behalf of Negro interests without having to organize Negroes."[38]

The Black intelligentsia strongly objected to the role of Whites in Negro leadership as well as the role of preachers. The most effective critique of the role of Whites in the Negro leadership group was rendered by R. Bunche in one of his memoranda for the Myrdal study. Bunche criticized the whole philosophy of interracial liberalism, arguing that White men exercised disproportionate influence in the selection of Negro leaders, and that Negro leaders, in their quest for respectability, showed too much concern for the opinion of Whites and, as a result, too little concern for the plight of the masses.[39] The literature also indicates that the role of Whites was greatly diminished during the 1960s with the transformation to "Black Leadership."

Just as teachers have been excluded from the leadership ranks due to the vulnerability concept, so have Black

educational institutions. Organizationally, the NAACP and the Urban League are, without question, the most important organizations in the Negro struggle against the caste system.[40]

The most persistent and common basis of classifying Negro leaders has been in terms of some variation of the militancy concept. As far back as 1944, Myrdal typed Negro leaders in terms of accommodation and protest. J. Higman argues that, in one way or another, the choice between a leadership of protest and a leadership of accommodation has also been characteristic of nearly all other ethnic groups in the United States.[41] Myrdal's classic formulation is based on the extreme policies of behavior on behalf of the Negro as a subordinate caste: accommodation or protest. He goes on to say that because of their subordinate caste position, Negroes find all their power relations confined to the narrow orbit of accommodation or protest, or to compromise between the two concepts.[42] Thus, the typology is based on observed regularities in the behavior of Negro leaders rather than on some abstract preconception.

Accommodation is described by Myrdal as historically the "natural," "normal," or "realistic" pattern of leadership behavior among Negroes, especially in the South. Accommodation requires acceptance of the caste system; thus, leaders "lead" only in that context. In other words,

they seek modifications in the life conditions of Negroes that do not affect the caste structure. Protest, on the other hand, involves a rejection of the caste system. Behaviorally, the pattern consists of lobbying, litigation, and non-violent protest in deference to law, American creed, and the tenets of Christianity. The protest leader is most often observed in the North because the less rigid system of racial oppression in many northern communities provides the opportunity for protest to exist.

M. Burgess also developed a typology of leadership types. Her four-fold schema includes:

> (1) The Conservatives: Defined as those persons who are least likely to voice opposition to caste, conforming closely to Myrdal's accommodation pattern of 'pleading to Whites.'
>
> (2) The Liberals: Defined as the largest of the types, and distinguished by their use of conventional political methods; for example, voting, lobbying, and litigation, to protest caste.
>
> (3) The Moderates: Characterized as functional leaders who subordinate their role as race leaders to their role as leaders in the community generally.
>
> (4) The Radicals: Distinguished on the basis of their identification with the masses, mass demonstrations, and the approach of Martin Luther King.[43]

Similarly, D. Thompson identified four types of leaders based on his research in New Orleans, Louisiana:

> (1) 'Uncle Toms,' who accept the caste system;

> (2) 'Race Men,' who militantly reject the caste system and engage in overt forms of non-violent protests;
>
> (3) 'Liberals,' who also reject the caste system, but who rely on moral persuasion and appeals to the national government; and
>
> (4) 'Race Diplomats,' who strike a middle ground between race men and Uncle Toms through reliance on education and persuasion to incrementally change the system.[44]

Finally, J. Wilson labeled Negro leaders as "moderates" or "militants" in terms of whether they sought "status or welfare" goals, whether they tended to seek racial explanations for apparent anti-Negro acts, whether they tended to agglomerate or disaggregate issues, and whether they relied upon mass protest and politico-legal remedies or persuasion, education, and behind-the-scenes bargaining.[45] In general, the moderates preferred "welfare" to "status" goals (that is, immediate, tangible benefits rather than the more abstract goal of integration) and tended to seek non-racial explanations for apparently anti-Negro acts; to disaggregate issues; to have less confidence in mass protests or legal-political solutions. Wilson also identified three functional leadership types: the prestige leader, the token leader, and the organizer.[46]

Fundamentally, the Negro leadership typologies appear to be based on a composite of goals, methods, and rhetoric. These variables are the explicit elements of E. Ladd's leadership typology. The factor that determines the

location of a particular type on what Ladd properly views as a leadership continuum is the degree of its acceptability to Whites.[47] In other words, Ladd is saying that the goals, methods, and rhetoric of militants are less acceptable to the dominant group of Whites than are those of moderates. Consequently, the goals and so forth of moderates are less acceptable than are those of the conservatives. Put another way, it can be said that leaders are more or less militant to the extent that their goals, methods, and rhetoric diverge from the conventional goals, methods, and rhetoric deemed appropriate by dominant-class Whites. Ladd's perspective on leadership documents continuity in the literature since it enables one to compare the content of different styles in different situations.

The predominant situation which affected the pattern of Negro leadership behavior was determined by the prevailing pattern of race relations. G. Myrdal contends that Negro leadership is a function of White politics and power.[48] J. Wilson accepts Myrdal's formulation but goes further. He states: "Segregation is a great determinant of Negro life in the city but it is not an invariable determinant. The structure and style of Negro politics reflect the politics of the city as a whole. Thus, Negro leadership and civic action are a function of constraints inside the Negro community."[49] Wilson defined the fundamental internal constraints on Negro politics (leadership)

as: (a) the existence of a large, economically depressed lower class and a small, isolated, underemployed middle class; and (b) the relative inability or unwillingness of the middle class to identify with the lower class and provide leadership for it.

Although Mack Jones strongly asserted that the literature on Negro leadership is atheoretical,[50] further analysis reveals at least three fragments of theory which can be identified as explaining observed regularities in Negro leadership behavior:

- The ideology of White supremacy and the structure of White superordination and Black subordination in power relations;
- The differential local patterns of White supremacy and dominance; and
- The factors internal to the Black community which are fundmentally class in character.

Theoretical Determinants of Black Leadership

The transformation from "Negro" to "Black" leadership, the continuities and discontinuities with the past, and the structural and attitudinal impact of the civil rights movement will be explored in this section. One of the major determinants of the transformation was population changes, i.e., the migration of Negroes from the rural South to the cities. The U. S. Census Bureau reported that between 1960 and 1970, the number of Negroes in central

cities increased by 3.3 million (from 9.9 million to 13.2 million), while the number of Whites remained the same (48.9 million). As a result, by 1974, 58 percent of the total Black population of the United States lived in the central cities.[51]

The Negro migration pattern to the North resulted in a larger, more prosperous, educationally and occupationally diversified middle class. Thus, the Black community was then able to recruit its leadership from a larger pool of skilled persons.

The civil rights revolution resulted in the passage of significant national and state legislation which had a profound impact on Negro leadership; e.g., the Civil Rights Act of 1964, the Voting Rights Act of 1965, the Fair Housing Act of 1968, and the Higher Education Act of 1965. Essentially, these laws removed the legal bases for racial dominance by Whites in the most important aspects of life.

The declining significance of race in the political system increased the range of maneuverability of Black leaders, because their thoughts and behaviors on behalf of Blacks were no longer limited to what Myrdal called the "narrow orbit of accommodation or protest." Rather, Black leaders were free to involve themselves in a variety of issues and problems beyond the traditional concerns of the civil rights leadership. Secondly, the focus of leadership shifted somewhat to the organizational level

where decision-making is relatively more independent of Whites. Thirdly, Black leadership today is more integrated into dominant systems of governance and influence, including not only leading Blacks who are elected and appointed government officials but also persons in the prestigious media, corporate, and trade union hierarchies, the elite universities, and the philanthropic community.

Black leadership is defined by M. Holden as those who seek or claim to seek the interests of the whole Black population.[52] He goes on to say that such persons purport to lead by defining for Blacks how they should relate to Whites. He also suggests that it is appropriate to regard as a leader anyone who holds a key position in any of the major Black socioeconomic institutions. Conversely, J. Higham stated that ethnic leadership has to do with internal processes of community development and symbolic expression.[53]

The Black leadership literature largely ignores the problems of the leadership concept. Rather, it focuses on Black elected officials who are implicitly assumed to be leaders by virtue of their holding office. However, there are some patterns and trends which are indicative of Black leadership and document a limited continuity with the literature on Negro leadership. M. Holden, in his wide-ranging inquiry, interprets Black politics as occurring at both the local and national levels through a fairly

well-defined and stable set of relationships which he calls the Black "quasi-government."[54] Specifically, he argues that there is a constant interplay or interaction among the elites of the "major socioeconomic institutions" or organizations of the community that produces a central tendency which becomes the judgment of the Black community. In his view, the structure of power in the Black community is held together by the interdependent elites of the major Black socioeconomic institutions and by a fairly stable leadership recruitment process that allows for the incorporation into the Black political world of such diverse personalities as Roy Wilkins and Stokely Carmichael. Holden contends that "there is a certain stability in the continuation of persons in leadership roles over very long times while, over the same times, new leadership personnel are constantly added as competitors, but seldom merely replace or displace their predecessors."[55]

In a partial test of the Holden thesis, R. Smith found that among the Black political elites, there was empirical evidence of constant interplay among the various leaders and anecdotal evidence that this interaction eventuates in a consensus as to the judgment of the Black community, at least insofar as issues in the federal policy-making process are concerned.[56] With respect to the leadership recruitment process, L. Salamon studied the impact on the traditional Black leadership structure.[57] He argued that the

availability of elective offices to Blacks created the possibility of a host of new leadership roles which were relatively independent of Whites, and thus opened the possibility of a basic restructuring of the traditional leadership hierarchies. He also observed that a new non-establishment leadership was emerging to take advantage of the expanding opportunities and to compete with the old leaders for influence.

In terms of the leadership recruitment/displacement proposition, Salamon concluded that "even the Blacks with traditional backgrounds . . . evidence a change-oriented set of attitudes that distinguishes them markedly from the leaders of even a decade ago."[58] At the national level, R. Smith found a similar pattern.[59] The old-line leadership of Black civil rights, professional, and elected officials in the late 1960s incorporated the younger, more militant advocates of Black power and "caucus separatism" into the established leadership structure. Further, some established leaders also adopted the rhetoric and ideas of the young Black power revels. Thus, the available research supports Holden's argument regarding the stability, continuity, and adaptability of the Black power structure.

Holden also explored the impact of class, color, and social background on Black leadership. He divided the Black community into two major classes: The Bourgeois and The Folk. The Bourgeois class is divided into the

"Gentry" (i.e., the color conscious descendents of the free Negroes and mulattoes who exercised leadership during the Civil War and Reconstruction era) and the "Solid Middle Class," estimated at or about 25 percent of the population (i.e., people whose middle-class status is defined in the same terms as the middle-class status of their White counterparts).[60] The Folk are divided into the "Working Class Respectables," estimated at 30 percent of the Black population; the "Striving Poor," persons who work full-time but at poverty level wages; and the "Immobile Poor," the long-term unemployed and the welfare dependent.[61]

Although Holden writes that the Bourgeois class has remained the source of Black leadership, ". . . it has not been able to redeem the promises which--as a leadership group--it has overtly and implicitly made to produce racial change on a scale, and in a form, suitable to most of the Black population."[62] As a result, Holden contends that there exists within the Black community a process he calls "centrifugation" (i.e., a tendency toward severe internal conflict).[63] This tendency has been reported in the literature about the Negro leadership group. Therefore, it appears that the transformation in leadership that occurred in the 1960s, while perhaps diminishing this phenomenon, did not eliminate it as a factor in subcommunity leadership.

The new literature provides no additional data on the ethnic origins of Black leaders. While there are some

indications that the Black establishment is losing its caste-color flavor as a result of the events of the 1960s, there are no data available to establish this as conclusive fact. In fact, a social background profile of the new Black leadership closely resembles the old Negro leadership of largely middle-aged, middle-class men. This observation certainly holds for both current and past presidents of historically Black colleges and universities.

Recent research on Black organizations focuses on their effectiveness in the policy-making process. H. Wolman and N. Thomas found, in the middle 1960s, that Blacks lacked effective access to centers of decision-making in housing and education, not because the system was closed to them but because they lacked effective organization, and the limited organizational resources available were too narrowly focused on civil rights.[64] Similarly, R. Smith[65] and D. Pinderhuges[66] found that Black organizations have developed nominal access to most federal policy areas, and have enlarged their focus to include the full range of domestic and foreign policy. However, they also found that this multiplicity of issues which are arenas of concern to Black groups and the resource difficulties of the subordinate, dependent Black community "weaken their likelihood of being taken seriously within any of these arenas." D. Pinderhuges[67] and H. Bailey[68] both conclude that the "middle-class" strategy of lobbying, litigating, and

electioneering alone cannot be effective in meliorating the multiple problems of the Black community.

On the liberalism-conservatism continuum, the evidence on Black leadership is unambiguous. The best evidence can be found in the landmark study of American voting behavior and opinion. N. Nie and J. Petrocik, authors of this study, wrote:

> Blacks hold predominantly liberal attitudes on the issues in the 1950s. Twenty-five percent were in the most extreme liberal decile, and a full 65 percent were to be found in the three most liberal deciles. The remainder of the Black population was moderately liberal, with less than seven percent of all Blacks giving responses which placed them in any decile on the conservative side of the line. However, even with a predominantly liberal provide in the 1950s, the degree of change in political attitudes is greater for Blacks than for any other group in the population. The extreme homogenous liberal opinion profile of Blacks in the early 1970s is striking. We found 25 percent of all Blacks in the most liberal decile; we now find 62 percent of all Blacks at this point. What is more, 85 percent of all Black Americans now respond to the issues in a way which places them in the three most liberal deciles. . . . The leftward movement of the Black population has occurred only on the issues of central importance to Blacks but on issues of foreign policy and scope of government as well.[69]

These observations strongly suggest that Black leadership beliefs, as well as Black followership beliefs, are liberal and integrationist but committed also to the idea of racial solidarity.

M. Holden classifies Black leadership beliefs as clientage, opposition, and withdrawal.[70] "Clientage,"

which is akin to Myrdal's accommodation type, rejects direct challenges to White supremacy, relying instead on powerful Whites to effect change. "Opposition," which is akin to Myrdal's protest type, relies on appeals to the universalistic norms of democracy and protest within the framework of constitutionalism to change the behavior of Whites. "Withdrawal," which is akin to Black nationalism, rejects the norms and values of White society and calls for physical and/or psychological withdrawal from American society. M. Holden argues that, while the opposition type is dominant in the Black leadership group, all types can be found, and that the advocates of withdrawal increased in influence between 1966-1967.[71]

The literature on Black leadership tends to agree that Holden's book may be viewed as an academic manifesto of the integrationist wing of the Black leadership group in the United States. As such, it is probably the most systematic and cogent defense of integration extant. Holden argues that there is an "inescapable interdependence" between Blacks and Whites in the United States. As a result, he argues that integration is the only realistic objective for Blacks in the United States. He defines integration as the "result which exists when two or more diverse parties are brought together in what is a common political enterprise and a common structure of respect, even though each of the parties may also have certain

additional structures (self-development) peculiar to itself."[72] In the context of historically Black colleges and universities, the Federal Government's equity in education goals pose a direct threat to the existence and stability of colleges and universities established for the express purpose of educating Blacks. However, Holden argues that integration is desirable even though each of the parties may also have additional enterprises peculiar to itself. By this careful modification, he cuts at the core of the argument of the opponents of integration; he argues for integration without the loss of Black identity.

Specifically, Holden argues that the goal is an integrated society where there would be substantial evidence that race would not predict the distribution of either material benefits or psychic esteem in any significant degree.[73] In spite of the fact that evidence exists which substantially documents the fact that the distribution of material benefits in the United States is a function of race, it is the core belief and dream of the integrationist belief system that a society without these racial differentials in material and psychic well-being is both desirable and possible. In summary, the evidence is clear that the dominant belief or ideology among Black leaders is liberal integrationist, and that they are representative of the broad masses of Blacks in holding this belief.

The literature on Black leadership appears to be unconcerned with formulating generalizations of a theoretical nature. Most of the studies of Black leaders are exploratory and/or descriptive in design and purpose. Holden argues that the distinguishing and determinative feature of Black leadership is White supremacy. He identified two theoretically significant variables internal to the Black community: (1) There exists certain aspects of Afro-American culture that inhibit the leadership coordination required by scarce resources; and (2) there are class tensions between the Black middle-class and the masses which hinder leadership effectiveness.[74] Except for L. Salamon's modernization perspectives and M. Holden's culture construct, the theoretical approaches of the new literature on Black leadership are wholly consistent with the fragments of theory gleaned from the literature on Negro leadership. This suggests continuity in the Negro to Black leadership transformation, and forms a basis for a coherent effort at theory building.

The Situational Context of Black Leadership

P. Hersey and K. H. Blanchard recognized the impact of the environment (situation) in leadership behavior. They contend that leaders must adapt their leadership styles to varying situations.[75] Institutions of higher education

are complex organizations with unique goals, hierarchical systems and structures, officials who carry out specified duties, decision-making processes that set institutional policy, and a bureaucratic administration that handles routine business. Black institutions of higher education are in an intense struggle for survival, according to the Carnegie Commission on Higher Education report on Black colleges. They are faced with the following basic issues:

(1) Black students now have more options in choosing places to obtain college-level education.

(2) Colleges founded for Negroes must now compete with other institutions for students and faculty members.

(3) Colleges founded for Negroes must now compete with predominantly White institutions for financial support from government agencies and from foundations interested in providing young Blacks with greater access to educational opportunities.

(4) Emergence from isolation has reopened historic debates on the role of the colleges and universities founded for Negroes in educating Black men and women for participation in the life of the nation.

(5) Competition of colleges founded for Negroes for students, faculty, and financial resources increasingly centers less on what these colleges have achieved for Black Americans during the past century and more on their quality in the present as compared to White institutions.[76]

These issues relate in a direct way to the role and function of Black colleges and universities in a pluralistic

industrial society. In order for them to survive the academic struggle for relevance, they must relate to the concerns and needs of the Black community. According to James E. Cheek, President of Howard University, historically Black colleges and universities must look for new models for apportioning the proper mixture of research, education, and service functions, while at the same time, they must be aware of the challenge facing urban Black colleges and universities. He further stated:

> Society must depend upon its institutions not only to provide the ingredients for social stability, but also the direction for social change. Educational institutions, and particularly institutions of higher learning in our society, inescapably become the meeting ground where the issues of social value and social change come together.
>
> Precisely because the 'urban crisis' and the 'racial crisis' interlock, colleges and universities which have historically opened their mission and purpose and directed their resources and efforts with reference to the problems related to care cannot escape their responsibility to address themselves determinedly to the crisis of the cities.
>
> The health of civilized society is dependent upon the health of its cities; a modern technology and industrial society such as ours cannot maintain its strength if its cities decay. The decay of the cities can become the decay of the nation.
>
> This university (Howard) views keenly its responsibilities as it relates to this problem and must now begin the difficult but possible task of preparing itself to develop the new knowledge, the new technology, and to train the [scientists] and [technologists] to define the problems but also to develop the solutions.[77]

This statement implies a unique role for historically Black colleges and universities (HBCUs) and highlights the need to reassess their traditional role in both the broader community and in the Black community. It is the proposition of this study that increased participation in science and non-science research and development can play a key role in this process. Several authors have documented limited HBCU participation in science and technology, as well as science and non-science research and development. However, certain HBCUs are notable exceptions to this observation--Atlanta University, Howard University, Fisk University, and Tuskegee Institute. A. Bacon contends that the success of these HBCUs is a function of quality leadership.[78]

James E. Cheek again addressed leadership issues for Black higher education and indicated that there are many leadership agendas in higher education, as well as constituency groups--faculties, students, staff, alumni/ae, private benefactors, and other supporters, including (in some cases) governmental entities at the state and federal levels and the publics they represent.[79] He identified the key issue for Black leaders in higher education as ensuring educational equity and excellence for Black Americans within the context of the unique historical mission of predominantly Black institutions.

Cheek supports Niles C. White's thesis that HBCUs are not a homogenous group, although they have much in common

with each other as with predominantly White institutions of higher learning. He further states: "All of the institutions have a three-fold mission: education, research, and public service. However, HBCUs were founded as the chief instruments of racial progress for Black Americans."[80]

From a curriculum perspective, most of the HBCUs have maintained a liberal arts focus. B. Harleston emphasized the importance of revitalizing liberal arts. He states that it is a function of educational leadership to clarify about what the purposes of education are, particularly liberal education.[81] In support of this thesis, Cheek states that the quintessential aim of liberal education is that the student is exposed to a wide variety of learning experiences (in the humanities, social sciences, and natural sciences) that will enable him or her to better understand society and the world.[82]

Several other leadership issues have been raised by the United Negro College Fund, Inc., whose membership is comprised of the private HBCUs. Their perspective is that Federal assistance to private HBCUs is crucial since they do not receive state funds to help meet their total costs. In responding to the Federal research and development opportunities, Niles C. White stated that Federal agencies have tended to consider the HBCUs as a homogenous group.[83] The fact is, however, that these institutions vary greatly in size, urban/rural location, and curriculum. He goes on to

say that the priority shared by the private HBCUs is teaching. Although faculty research is carried out at all HBCUs at some level, a few have extensive laboratories, equipment, and specialized faculty necessary for large-scale research projects.

White appears to take issue with the Federal Agency Plan's goal of increasing research and development support for historically Black colleges and universities to the exclusion of policy, legislative, regulatory and funding areas which may be changed immediately. His argument is based on the premise that only nine HBCUs and Howard University have the infrastructure to support research and development. Substantiation for this observation can be found in the Federal Obligations Report which shows that Howard University and nine other HBCUs received more than one-half of all Federal funds going to all 106 historically Black colleges and universities.[84]

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C H A P T E R IV

FOUNDATIONS FOR STUDY DESIGN

Introduction

The essential challenge of this research study was to find and separate factors which are a consequence of the participation levels of historically Black colleges and universities (HBCUs) in Federal research and development (R&D) science and engineering programs. From the review of the literature, two groups of factors have been identified. They are labelled "predisposing factors" (aspects of HBCUs and their environment) and "facilitating factors" (features of the implementation of the Federal White House Initiative designed to strengthen HBCUs). This study focuses on those predisposing and facilitating factors and HBCU participation levels in Federal R&D science and engineering programs.

This research study was conducted with no commitment to a particular result. Whereas it will be methodologically beneficial to be able to single out predisposing and facilitating factors as significantly affecting participation levels, the study was carefully designed and is not committed to demonstrating the strength or showing the lack of strength of any of these factors. In a study of this nature, it is important to develop measures which are objective, reliable, sensitive, and valid.

Study Variables

Variables were chosen for the analysis on the basis of two criteria. First, the factors had to be theoretically important and measurable within the constraints of the design. Second, the factors had to be quantitatively measurable. The variables are listed first, and then developed theoretically and empirically. This reduces the possibility that a long discussion of a single variable will obscure its membership in the whole set of factors.

Dependent Variable

The dependent variable is HBCU participation levels in Federal R&D science and engineering programs. Some institutions chose to participate in Federal programs designed to strengthen their research and and technology capacity while others did not. Probably the most important among conditions which distinguish elective behavior from other measures is institutional leadership. Historically, the measure of an institution's ability or desire to participate in specific Federal programs has been dependent upon and confounded by both internal and external barriers. Clearly, not all Federal programs in science and engineering are appropriate for all HBCUs. Participation levels were determined from Federal data bases reporting type and amount of funds awarded to HBCUs. There are several crucial factors in HBCU decisions to participate in Federal

R&D programs. However, not all of these factors could be considered in this study.

Probably most important among the factors is the pre-existence of science and mathematics as majors as well as the existence of graduate programs in the biological and physical sciences. Such preexisting conditions mean that a particular HBCU would have faculty with advanced degrees in science and engineering as well as the research administrative infrastructure to carry out such programs.

Items chosen to measure extent and consistency of participation in Federal R&D science and engineering programs are related to the level or funding for research and development over a period of eight years. Research and development funding includes the following areas: engineering, physical science, mathematics and computer science, environmental science and life sciences. Operationally, participation levels are empirically defined by averaging the grant funding levels among the selected institutions and utilizing the standard deviation to determine gradations. For instance, a high level of participation is defined as two or more standard deviations above the mean, low participation is two or more standard deviations below the mean, and moderate participation is one standard deviation above or below the mean.

The National Science Foundation defines research and development as all research activities, both basic and

applied, and all development activities that are supported at universities and colleges.[1] Demonstration projects conducted to discover whether a technology or method is workable are considered to be within the scope of research and development if their objective is to produce new information within a specific time period. Research is defined as systematic study directed toward fuller scientific knowledge of the subject studied.

In defining basic research, the National Science Foundation states that the investigation is oriented toward gaining a better knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications toward processes or products in mind. Applied research is defined as an investigation aimed at gaining the knowledge or understanding necessary for determining the means by which a recognized and specific need may be met. Development, on the other hand, is the systematic use of knowledge and understanding gained from research directed toward the production of useful materials, devices, systems, or methods, including design and development of prototypes and processes. Also included as research and development is research equipment which refers to any item or interrelated collection of items comprising a system of non-expandable, tangible property or software having a useful life of more than two years and an acquisition cost of $500 or more which is used wholly or in part for research.

Independent Variables

The set of independent variables chosen consist of four classes of predisposing factors and four classes of facilitating factors. This set of variables is considered independent only in the sense that they are assumed to be unaffected by changes in the variable designated as the dependent variable, and yet are able to influence HBCU research and development funding levels. The independent variables are probably not independent of one another. The assumption of the direction of causality is not statistically testable in an uncontrolled experiment and relies for its support on *a priori* analysis.

Predisposing and facilitating factors indicate whether the independent variables are expected to be reflectors of situations the HBCUs cannot change or those within their influence. The predisposing factors are important as predictors of HBCU responsiveness to their own needs for growth and stability, as well as their marketability. Facilitating factors, on the other hand, can show how the configuration of Federal programs affect these characteristics.

Operational indicators of predisposing factors are:

(1) Academic Characteristics

- Accreditation Status of Academic and Professional Programs

- Graduate and Professional Degree Programs
- Level of Degrees
- Curriculum Concentrations and Majors

(2) Student Characteristics

- Student Enrollment
- Student Enrollment in Science and Engineering
- Admission Criteria
- Tuition

(3) Institutional Characteristics

- Governance
- Type of Control
- President's Highest Degree and Area

Operational indicators of facilitating factors are the mix of Federal programs available to HBCUs in the following areas:

(1) Facilities and Equipment for Instruction in Science and Engineering: Includes all programs whose main purpose is to provide support for the construction, acquisition, renovation, modification, repair, or rental of facilities, land, or equipment for use in instruction in science and engineering.

(2) Fellowships, Traineeships, and Training Grants: Includes graduate programs in support of the development and maintenance of science and engineering personnel resources.

(3) Institutional Support for Science and Engineering: Includes programs that support academic departments, institutes, or institutions as a whole, and embody varying types of support ranging from support provided without any specification or purpose

other than that the funds be used for scientific projects, to projects that provide funds for activities within a specified field of science and engineering without a specific purpose. NIH's Biomedical Support Grants and General Research Support Grants are examples of these types of programs.

(4) Technical Assistance, Conferences, and Student Recruitment: Includes support of technical conferences, teacher institutes, short courses, research participation, inservice seminars, and activities aimed at increasing the scientific knowledge of precollege and undergraduate students.

General Hypotheses

Clearly, it is not possible to include all factors of HBCU participation in Federal R&D science and engineering programs in this study. Therefore, it is essential to concentrate on two specific treatments of the variables. First, the study will determine if the variables selected, especially those which can be operated by Federal policy planners, are significantly related to growth and stability of Black institutions of higher education. It is also necessary, as a second step, to discover the extent to which the variables that constitute the independent set are related to one another. Together, these should reflect on the validity of employing the proportion of HBCUs which have achieved growth and stability as a criterion for evaluating a Federal program.

The first two hypotheses are a reflection of the expectation that the choice of variables is appropriate and that one particular group will predominate. The remaining hypotheses are general postulations deduced from the literature.

Hypothesis 1: The factors chosen for this study, when taken together, account for a large proportion of the variation in HBCU participation levels in Federal R&D science and engineering programs.

Hypothesis 2: HBCU academic and student characteristics are strongly correlated and explain the greatest part of the variation in HBCU participation levels in Federal R&D science and engineering programs.

Just as important as the strength of the group of variables is the extent to which they are interrelated. When several variables act in concert, there is a strong possibility that efforts to affect the dependent variable by changing one factor will be confounded by the stability of others which relate to it.

Hypothesis 3: The variables listed as independent have strong relationships among themselves and can be grouped into component factors which give important information on HBCU efforts to expand their curriculum and relevance in the Science and Engineering fields.

The ability of the theoretical model to explain HBCU participation levels in Federal R&D science and engineering programs is an important consideration of this study.

However, a more important consideration concerns the implications of the ability to separate the model into predisposing conditions and facilitating factors. Predisposing conditions are characteristics of the institutions under study; while facilitating factors are the consequences of Federal policy and initiatives to strengthen HBCUs. Therefore, it is important to this study to establish whether institutional characteristics affect HBCU funding levels in Federal R&D science and engineering programs by themselves, after controlling for the effects of the facilitating factors.

Hypothesis 4: Predisposing conditions exhibit a strong relationship with HBCU participation levels in Federal R&D science and engineering programs.

Hypothesis 5: Facilitating factors exhibit a strong relationship with HBCU decisions to expand their curriculum and seek growth and stability in science and engineering.

Hypothesis 6: The facilitating factors "Federal Funds for Facilities and Equipment for Instruction in Science and Engineering" and "Fellowships, Traineeships, and Training Grants" are sufficient as a unit to explain a significant proportion of the variation in HBCU participation levels in Federal R&D science and engineering programs.

The purpose of this set of hypotheses is to establish the correctness of choice of factors for a model to test the effects of HBCU participation levels in Federal R&D

science and engineering programs, to test the methodology of combining these factors and separating these factors on an *a priori* basis, to cast light on Federal policy decisions with regard to affecting HBCU utilization of Federal supports and opportunities by altering the configuration of programs, and to look closely at the extent to which Federal programs in science and engineering strengthened and expanded opportunities for historically Black colleges and universities in research and development.

End Notes

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C H A P T E R V

STUDY METHODOLOGY

Introduction

This chapter presents a detailed description of the research methodology that was used for data acquisition and analysis. The specific procedures that were used in the treatment and analysis of each of the hypotheses are outlined in a step-by-step format. Sufficient detail is provided in order that the procedures may be replicated in future research as annual data becomes available from the National Center for Education Statistics (NCES) and the National Science Foundation (NSF).

The Population

The target population for this study was all four-year Black institutions of higher education--referred to in Executive Order 12320 as historically Black colleges and universities (HBCUs)--in the United States for the fiscal years 1982-1988. The data presented in the first part of the analysis were based on the entire population of four-year HBCUs (N=106). A listing of the 106 HBCUs selected for this study is found in Appendix A.

In the second part, detailed case studies are presented on a sample of four-year HBCUs. The case study approach

allowed for the presentation of qualitative data in greater detail to demonstrate the impact of the predisposing and facilitating factors on HBCU participation levels in Federal R&D science and engineering programs. Data are presented for two time intervals--1982 and 1988. The choice of the time intervals coincides with the first year of Executive Order 12320 (1981) and 1988 is the last year for which complete information was available.

The Case Study Method

The case study sample represents those HBCUs who received the highest level of funding in academic science and engineering in Fiscal Year 1988. The rationale for this approach is based on one of the basic assumptions of the theoretical model, i.e., facilitating factors exhibit a strong relationship with HBCU decisions to expand their curriculum and seek growth and stability in science and technology.

For purposes of this dissertation, a case study is defined as a method for learning about a complex instance--HBCU participation levels in Federal R&D science and engineering programs--based on a comprehensive understanding of that instance, taken as a whole and in its context.[1] More specifically, the complex instance refers to the extent to which HBCUs are stronger and more competitive as

a result of participation in Federal programs emanating from the White House Initiative on HBCUs. The reference to complex instance in the definition means that input--predisposing characteristics of HBCUs and facilitating factors (Federal funds for instructional and institutional support)--and output--actual HBCU R&D funding levels--cannot readily and very accurately be related.

There are several reasons why such a relationship is difficult. There are many influences on what is happening and these influences are believed to interact in non-linear ways such that a unit of change in the input can be associated with quite different changes in the output, sometimes increasing it, sometimes decreasing it, and sometimes having no discernible effect.

One of the goals of the case study is to obtain as complete a picture as possible of what is going on in a complex situation. By focusing on a few representative cases, it is possible to explore many factors and qualitatively assess their impact on HBCUs. This is accomplished in three ways. First, the case studies involved extensive descriptions of institutional characteristics of HBCUs and their involvement in Federal activities mandated under Executive Order 12320. Second, information on HBCU participation levels was collected from two different sources which allowed for corroboration. This means that reliability of the findings was enhanced. Third, the validity

of the findings, particularly validity with regard to cause and effect, was derived from agreement among the types of data sources, together with the systematic ruling out of alternative explanations. Verification of data was accomplished by examining consistency of evidence across different types of data sources and over time utilizing pattern matching, explanation building, and thematic review strategies.

Several case study methodologies were appropriate for this endeavor. However, the program effects case study methodology was selected because of its ability to determine the effects of the Federal R&D programs in science and engineering and point to reasons for successes or failures. This type of case study has been successfully used by Federal agencies in answering program effects questions. For instance, the National Science Foundation assessed the effectiveness of a cooperative science program aimed at increasing innovation and knowledge transfer between university and industry researchers.[2] The National Science Foundation conducted ten case studies of a carefully selected group of projects which ranged from computer language systems through nuclear science to fisheries biology and chemical engineering. Also, in a companion report, results from a survey of grant recipients were analyzed, giving both a quantitative and qualitative sense of how the program was working. Results from the two methods

were not integrated; both suggested, however, that the program was generally working well.

In order to provide the best possible analysis of the problem of HBCU participation levels in Federally-sponsored science and engineering programs, the case studies were conducted first on a set of institutions chosen for representativeness, and then the findings from the case studies were verified through targeted examination of administrative data, prior reports, and interviews with select educational experts and Federal officials. Case studies of twenty selected HBCUs are found in Appendix B.

Data Sources

Data supporting the study were collected from three major sources: the Department of Education's National Center for Education Statistics (NCES), the National Science Foundation (NSF), and the National Association for Equal Opportunity (NAFEO).

The NCES is charged with the responsibility for the Higher Education General Information Survey (HEGIS) of Financial Statistics of Institutions of Higher Education each year. The data are stored in the computer files of NCES and are available to the public. NCES publishes selected HEGIS data in various reports and documents. These reports were not in sufficient detail to meet the

full data requirements for the dissertation. However, data on Federal obligations and expenditures in research and development was used to compare and verify data from other sources. Further, one of the limitations of the HEGIS data base was that it did not contain Carnegie classifications. To overcome this limitation, a search of the NSF reports on HBCUs revealed the existence of extensive data bases on academic science and engineering resources. The Surveys and Analysis Section in the Division of Science Resources Studies of the National Science Foundation is responsible for the collection and analysis of data on academic science and engineering resources. Three major survey data systems are currently included in the Academic Integrated Data Base:

- The Survey of Scientific and Engineering Expenditures at Universities and Colleges: The Survey collects information from academic institutions; the respondent is typically located in the central financial, research administration, or institutional studies office of that institution.

- The Survey of Graduate Science and Engineering Students and Post-Doctorates: The respondents are individual departments within academic institutions; the departmental responses are coordinated by one individual with each graduate or medical school.

- The Survey of Federal Support to Universities, Colleges, and Selected Non-Profit Institutions: Data are collected from fifteen Federal agencies which provide virtually all Federal obligations to academic institutions for R&D activities.

After completion of the annual surveys, the National Science Foundation stores the data on magnetic tape for both public use and archival purposes. For each survey, a tape containing all data currently stored in the data base for that survey is generated and the new survey data is added. The tape contains separate files for each survey year, including any corrections to prior year data which may have been submitted by survey respondents. The data codes included in the data bases are: Institution, School, and Department identifiers, i.e., Federal Interagency Committee on Education (FICE) Number, School Identification Number (SIN), and Department Identification Number (DIN) codes.

The National Science Foundation provided the most comprehensive R&D expenditures data for the years of interest to this study--1981-1988. In fact, for each of the survey years, the NSF data base included items that correspond to the Fiscal Year 1988 survey form. Its sample design and structure included all of the HBCUs. Data records for academic institutions are grouped by agency/ subagency code, and within groups are ordered by science and engineering field code. There is at least one data record for each agency/subagency reporting obligations in seven basic categories, plus subtotal and total. The data record also includes obligations for research and development, fellowships, traineeships, and training grants. Since

there is an all-agency summary for each institution, in addition to the data for individual agencies, the minimum number of data cards for any institution on the tape is two--one summary record at the all-agency level, and another record for the specific agency/subagency reporting the obligations.

Data Collection

The data collection format was designed to measure eleven components of predisposing characteristics, four components of facilitating factors, and eight measures of HBCU participation levels in Federal R&D science and engineering programs. The researcher developed a form to record relevant data to ensure that complete data were available for each of the four-year HBCUs. This involved a search of the above-referenced data bases and printed reports to locate the required data for each of the 106 historically Black colleges and universities selected for this study.

End Notes

[1]J. A. Alford, The Use of the Case Study Method in Policy/Program Analysis (Washington, D. C.: Applied Research and Technology Institute, 1989).

[2]National Science Foundation, Cooperative Science: A National Study of University and Industry Researchers' Assessment of the Industry/University Cooperative Research Program, Vols. 1 and 2 (Washington, D. C.: November 1984).

C H A P T E R VI

DATA ANALYSIS

Introduction

This chapter presents the data analysis organized within the context of the major research questions and sub-questions. As stated in the previous chapter, the analysis will provide information on historically Black colleges and universities (HBCUs) with respect to source and level of participation in Federal science and engineering programs. More detailed information is provided for the HBCUs selected for case studies. The critical incident in this analysis is growth and stability of HBCUs as a direct function of Federal programs made possible under the Historically Black Colleges and Universities Initiative, Executive Order 12320.

Implementing Questions

1. What types of Federal science and technology programs are available to strengthen the research opportunities and academic programs at historically Black colleges and universities? The following programs are available to strengthen the research opportunities and academic programs at historically Black colleges and universities:

(a) Research and Development. This category includes: (1) All research activities, both basic and applied; (2) all development

activities that are supported at universities and colleges; (3) demonstration projects conducted to discover whether a technology or method is workable; and (4) research equipment.

(b) Research and Development Plant Costs. This category includes: all direct, indirect, and related costs of projects whose main objective is to provide support for the construction, acquisition, renovation, modification, repair, or rental of facilities, land works, or equipment for use in scientific or engineering research and development.

(c) Instructional Facilities and Equipment. This category includes: all programs whose main purpose is to provide support for the construction, acquisition, renovation, modification, repair, or rental of facilities, land works, or equipment for use in instruction in science and engineering.

(d) Fellowships, Traineeships, and Training Grants. This category includes: graduate programs in support of the development and maintenance of science and engineering personnel resources.

(e) General Support for Science and Engineering. This category includes: support programs that support non-specific or generalized purposes related to scientific research and education. Projects in this category are generally oriented toward academic departments, institutes, or institutions as a whole, and embody varying types of support; ranging from support provided without any specification or purpose other than that the funds be used for scientific projects, to projects that provide funds for activities within specified field of science and engineering without a specific purpose.

(f) General Support for Other Science and Engineering. This category includes: Precollege Career Development in Science,

> Mathematics, and Engineering. It includes: activities in support of technical conferences, teacher institutes, and activities aimed at increasing the scientific knowledge of precollege undergraduate students.

2. How are these programs administered and what methods of outreach are utilized to inform historically Black colleges and universities? Federal programs designed to support historically Black colleges and universities grew out of efforts on the part of Federal agencies to meet the requirements of Executive Order 12320. One of the first tasks under this Order was the identification of barriers which prevented HBCUs from full participation in Federal programs designed for higher education. Federal agencies were instructed to identify and eliminate barriers of a regulatory, policy, and programmatic nature which resulted in reduced HBCU participation in Federally-sponsored programs.

Federal agency strategies included a variety of resources and mechanisms to increase HBCU participation. The predominant and most frequently used strategies included outreach and technical assistance campaigns, including professional conferences, site visits, regional workshops, instructional seminars, task forces, advisory committees, discretionary authorities, and set-aside provisions. The training-related activities were designed to enhance HBCU application skills and techniques for discretionary programs.

With respect to science and engineering, the following Federal agencies developed specific strategies to strengthen HBCUs: the Departments of Energy, Health and Human Services, and Transportation; the National Science Foundation (NSF) and the National Aeronautics and Space Administration (NASA). These strategies included procurement conferences, the development and maintenance of a data base on the research and development capabilities of HBCUs, inclusion of HBCU representatives on Peer Review Teams, the establishment of advisory committees to develop and maintain a resource pool of talented Black engineers and scientists for potential recruitment to professional positions at NASA, as well as stimulating and reinforcing HBCU enrollment in programs of science, engineering, and technology; and the establishment of a travel fund to support energy research-related travel for HBCU personnel. The fund made possible the continued professional development, information exchange, and resource sharing for HBCUs underrepresented in areas of research and development.

Throughout the period, 1982-1988, Federal agencies continued to refine their strategies for improving HBCU access to Federally-sponsored programs. Earlier efforts were hampered by the inability of certain agencies to set-aside funds earmarked exclusively for HBCUs, policies which did not allow indirect cost rates to be negotiated on a project-by-project basis, the limited number of agencies

which offered small to medium-sized awards that were specifically designed to increase HBCUs competitiveness in conducting research, and the limited involvement of certain agencies in cooperative projects with the private sector. Recognition of these barriers led the National Science Foundation to set up a committee composed of persons from each Foundation Directorate to review progress on the implementation of Executive Order 12320 and to assist prospective proposers from HBCUs through activities that included analysis of model proposals, proposal development kits, on-site workshops, and seminars on preparing competitive research proposals. Several other agencies followed the lead of the National Science Foundation and organized formal committees to review their implementation plans and progress toward the goal of strengthening HBCUs in science and engineering, as well as technical assistance support in the grant application process.

A review of the reported strategies revealed a strong focus on information dissemination and the development of agency-level policy and funding initiatives. This level of effort resulted in innovative set-aside programs, cooperative agreements, collaborative arrangements, special demonstration projects, and curriculum development.

Analysis of information reported in the Annual Performance Reports for the years 1982-1988 revealed that past activities and relationships with HBCUs had, in fact,

led to a better understanding of the preeminent priorities--"obtaining necessary human, fiscal, and physical resources." Federal agencies then sought to develop strategies which would contribute to the effective and efficient management of resources. It was recognized that HBCUs' lack of success resulted from insufficient fiscal resources, geographic isolation, and difficulty in replacing staff desiring short- and long-term leaves. In order to meet these expressed needs, Federal agencies undertook a variety of activities, which included workshops, site visits, professional seminars, technical assistance, and curriculum development.

In the area of science and engineering, several exemplary cooperative programs were initiated in 1984:

- The Environmental Protection Agency's (EPA) Solid Waste and Emergency Response grant program for HBCUs provided administrative funds to the Atlanta University Center to encourage and support a Dual-Degree Program in Engineering with the Georgia Institute of Technology, Boston College, and Massachusetts Institute of Technology. Upon completion of the five-year curriculum, the student earned a Bachelor of Science (B.S.) degree in Mathematics or Science in addition to a B.S. in Engineering.

- Howard University's School of Engineering entered into a similar arrangement with other traditionally Black colleges--Bowie State College, Morgan State College, and Hampton University.

- NASA began several collaborative faculty development activities between HBCUs and their National Laboratories. For instance, NASA sponsored:

-- A Life Sciences Summer Faculty Fellowship Program at Tuskegee Institute's School of Veterinary Medicine, and internships at NASA's Jet Propulsion Laboratory for the HBCU School of Engineering Deans on Computer Aided Design (CAD) facilities and continued support to Tuskegee in their efforts to develop CAD facilities for teaching and research purposes.

-- The development of industrial engineering curricula geared to high technology at North Carolina A&T State University.

-- The development of a Symposium at Florida A&M University on Chronophamacokinetics affecting Space Travel involving experts in drug therapy for space travel and transamerican air flights.

-- The development of a Ph.D. program in Pharmaceutical Sciences at Florida A&M University.

-- The development of a Bachelor and Master's degree programs in Computer Science at Bowie State College.

These types of activities and programs for HBCUs were continued in subsequent years. However, beginning in 1985, the emphasis shifted from information sharing to a focus on improving HBCU infrastructure in research. Federal agency strategies became more structured and directed toward specific projects at HBCUs. The prevailing approach appeared to be the establishment of cooperative agreements, i.e., arrangements between HBCUs and majority research institutions and national laboratories, and between large HBCUs with advanced programs in science and engineering and smaller developing HBCUs. Cooperative agreements also

included teaching fellowships, faculty development, and curriculum development.

In an effort to support the administrative infrastructure for research, the National Science Foundation focused on assisting HBCUs in their management of research programs. The Foundation's Research Improvement in Minority Institutions (RIMI) program initiated annual seminars in Washington, D. C., for HBCU management personnel to provide technical assistance through a wide range of activities, including preparation of competitive proposals, preparation of quality research articles for professional journals, and site visits to outstanding research projects at minority institutions.

By 1986, Federal agencies had begun to reach out to private sector businesses and institutions in strengthening HBCUs. Private sector involvement was required under Executive Order 12320. To facilitate this approach, a Science and Technology Conference was sponsored by the Executive Office of the President, Office of Science and Technology Policy, and the U. S. Department of Education, Office of the White House Initiative on Historically Black Colleges and Universities. The purpose of the Conference was to demonstrate and expand HBCU research programs in science and technology through alliances with the private sector and the Federal Government and to commemorate the signing of Executive Order 12320. It was anticipated that

this conference would be the beginning of a sustained effort to recognize exemplary relationships and to provide incentives for the formation of new alliances between HBCUs, the Federal government, and the private sector. Several Cooperative Agreements grew out of this effort.

During 1987, the number of Federal agencies providing science and engineering support to HBCUs grew from five to eight. However, the major types of support continued to be information sharing through conferences, workshops, site visits, and summer internships. Exemplary activities during this period were the following:

- Department of Agriculture's Cooperative State Research Service provided funds to enhance the infrastructure at the 1890 Land Grant Colleges, to include Tuskegee University for agricultural research purposes.

- Department of Energy made six awards to support the research infrastructure at three HBCUs--Alabama A&M, Atlanta University, and North Carolina A&T University.

- NASA entered into a partnership with HBCUs to assist in preparing faculty and students for scientific leadership.

- NASA's National Space Technology Laboratories entered into a three-year Cooperative Agreement with the Computer Science Department at Jackson State University to establish a research foundation in Spatial Data Management and Analysis Systems.

During the last year for which this study covers, 1988, Federal agencies continued to support the research administrative infrastructure of HBCUs through information sharing and technical assistance, as well as continued funding

under the Cooperative Agreements. Perhaps one of the most effective Cooperative Agreements was the Department of Energy-Howard University Satellite Telecommunications Program. Under this program, Howard University developed a tool called SCITECH, which can be used by researchers at HBCUs to improve the effectiveness with which they are able to develop research proposals, access data bases, and conduct collaborative research and development activities.

In summary, the types of Federal science and technology programs available to strengthen the research opportunities and academic programs at historically Black colleges and universities can be classified as:

- Grants (competitive and discretionary and set-asides)
- Cooperative Agreements
- Information Dissemination
- Technical Assistance
- Curriculum Development
- Faculty/Student Development

3. What are the predisposing characteristics of the participating historically Black colleges and universities?

For the last ten years, the Executive Branch of the Federal Government has established many programs and initiatives designed to increase the accessibility of funds to historically Black colleges and universities. In most cases, these funds were in the form of grants and contracts.

Under the Reagan Administration, Executive Order 12320 directed the Secretary of Education to supervise, on an annual basis, the development of a Federal program designed to achieve significant increases in participation by HBCUs in Federally-sponsored programs.

Each Federal Government department and/or agency was directed to establish Annual Plans to increase the ability of HBCUs to participate in research and other Federally-sponsored activities and submit mid-year and annual performance reports of these activities.

These reports provided the primary source of information and data to support this research endeavor. The choice of principal variable, both facilitating and predisposing factors, were made after considerable investigation into the literature with regard to studies on the growth and stability of institutions of higher learning and leadership effects. The methods employed to discover the effects of the predisposing and facilitating factors upon participation levels in Federally-sponsored science and technology programs involve four major activities:

(1) Identification and inventory of Federal science and technology programs which provide and support service to historically Black colleges and universities.

(2) Development of case studies on a select number of HBCUs to identify factors

contributing to varying participation levels in Federally-sponsored science and technology programs.

(3) Review of various studies related to the goals of strengthening the research capacity of HBCUs.

(4) Discussion of issues of barriers to HBCU participation in research and technology with knowledgeable educators and Federal government officials.

For the purposes of this dissertation, the predisposing factors were the descriptive characteristics of historically Black colleges and universities. They are as follows:

- Size Characteristic (student enrollment)
- Faculty Size and Characteristics (tenure, Ph.D. degree, etc.)
- Type of Majors and Curriculum Concentrations
- Level of Degrees Offered
- Type of Control (public vs. private)
- Admission Criteria
- Number of Degrees Awarded in the Quantitatively-Based Disciplines
- Mission

Considerations concerning predisposing and facilitating features of the HBCUs were matched in such a way as to

their interrelationship and to provide an opportunity to separate them where their differences were important. For example, in the case of the effect of faculty characteristics upon participation levels in Federally-sponsored programs to strengthen their research capacity, the study demonstrated that select predisposing characteristics such as quality of faculty and level of degree offered are better indicators of HBCU participation levels than the remaining predisposing characteristics. The implication is that if the human resource capability of HBCUs is limited, the focus of the initiatives needs to be redirected.

There were no assurances that increasing accessibility to Federally-sponsored science and technology increased HBCU participation levels. However, a certain pattern of predisposing characteristics of HBCUs had different participation levels, and then there was strong evidence that a change in the configuration of Federal programs does affect utilization. The methodological contribution of this dissertation suggested ways of separating these factors to minimize the distortion on enabling factors by predisposing features of historically Black colleges and universities.

The essential challenge of this dissertation was to find and to separate factors thought to correlate highly with participation levels in Federally-sponsored science and technology programs into two groups according to whether they were aspects of HBCUs and their environment or

features of the Federal programs. These theoretically casual variables, when separated as predisposing or facilitating, intimated at what level change can most likely be effected and identified the most likely factors for change within historically Black colleges and universities.

4. What types of facilitating factors are related to historically Black colleges' and universities' growth and stability which are a consequence of HBCU leadership?

The review of the literature and expert judgment shared by noteworthy educators tend to agree that leadership plays a significant role in HBCU grant activity. The contributing factors tend to be indicators of formalized industry connections, access to special laboratory facilities or the existence of special laboratories on the HBCU campuses, and change in the institution's mission. While these factors are conceptually relevant, they were difficult to measure. Therefore, a more direct approach was chosen to identify measurable indicators. In reviewing all programs under the White House Initiative on Historically Black Colleges and Universities, several were specifically designed to improve the infrastructure, student and faculty recruitment and development, curriculum development, and the physical plant.

Facilitating factors selected for this study are success in obtaining grant awards for:

(1) Fellowships, Traineeships, and Training: Includes graduate programs in support of the development and maintenance of scientific and engineering personnel resources.

(2) General Support in Science and Engineering: Includes programs that support non-specific or generalized purposes related to scientific research and education. Such projects are generally oriented toward academic departments, institutes, or institutions as a whole, and embody varying types of support--ranging from support provided without any specification of purpose other than the funds be used for scientific projects, to projects that provide funds for activities within a specified field of science and engineering without a specific purpose.

(3) Other Science and Engineering Activities: Includes all academic science and engineering activities that cannot meaningfully be assigned to one of the preceding categories. Types of activities include obligations in support of technical conferences, teacher institutes,

and activities aimed at increasing the scientific knowledge of precollege and undergraduate students.

(4) Non-Science and Engineering Activities: Includes all other obligations excluded from the foregoing categories defined but which represent direct from a Federal agency to an academic institution for activities or purposes not specifically related to science and engineering. Included are all obligations for research, education, and facilities in the arts and humanities, as well as generalized projects for which the proportion utilized for scientific or engineering activities is unknown.

In addressing the question of whether facilitating factors played a role in improving the capability and competitiveness of historically Black colleges and universities in acquiring R&D Grants, grant award data on the above-stated facilitating factors was collected for the years 1982-1988 and analyzed (see Figure 1). Mean scores for each factor were computed for each year and are presented in graphic form in Figures 2 to 5.

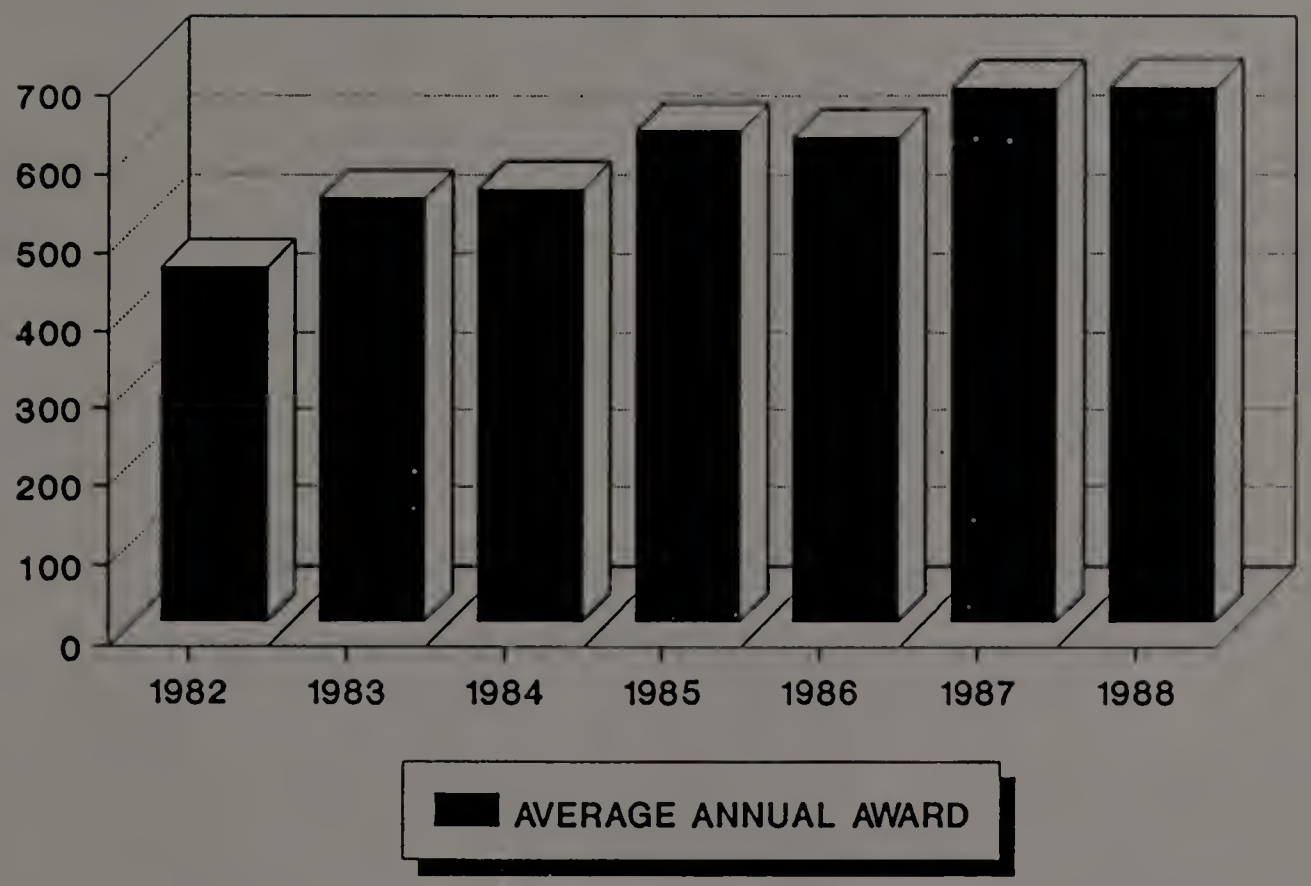

Figure 1. Mean R&D Awards (1982-1988)

Overall, the data shows a stable upward trend in the amount of grant awards over the seven-year period for each of the factors. Federal awards for Fellowships, Traineeships, and Training grew from a low of $7.7 million in 1982 to a high of $10.2 million in 1988. Figure 2 presents a description of this observation utilizing mean awards for the study years.

Figure 3 shows trends in Grant Awards for General Support in Science and Engineering for the years 1982 to 1988. Although growth remained relatively level from 1982 to 1986, significant gains were made in 1987 and 1988. The total amount of awards grew from a low of $14.1 million in 1982 to $2.4 million in 1987 and $2.7 million in 1988.

Figure 4 shows award trends for Other Science and Engineering for the years 1982 to 1988. Awards in this category grew from a low of $13.4 million in 1982 to $31.6 million in 1988. The most significant annual growth occurred between 1987 and 1988. This observation can perhaps be accounted for by the success of the National Science Foundation Technical Conferences and by increased funding by the United States Department of Agriculture's Extension Services. The Extension Services support was allocated among four program activities that aid farmers and rural communities in the areas of agriculture, biology, economics, and sociology.

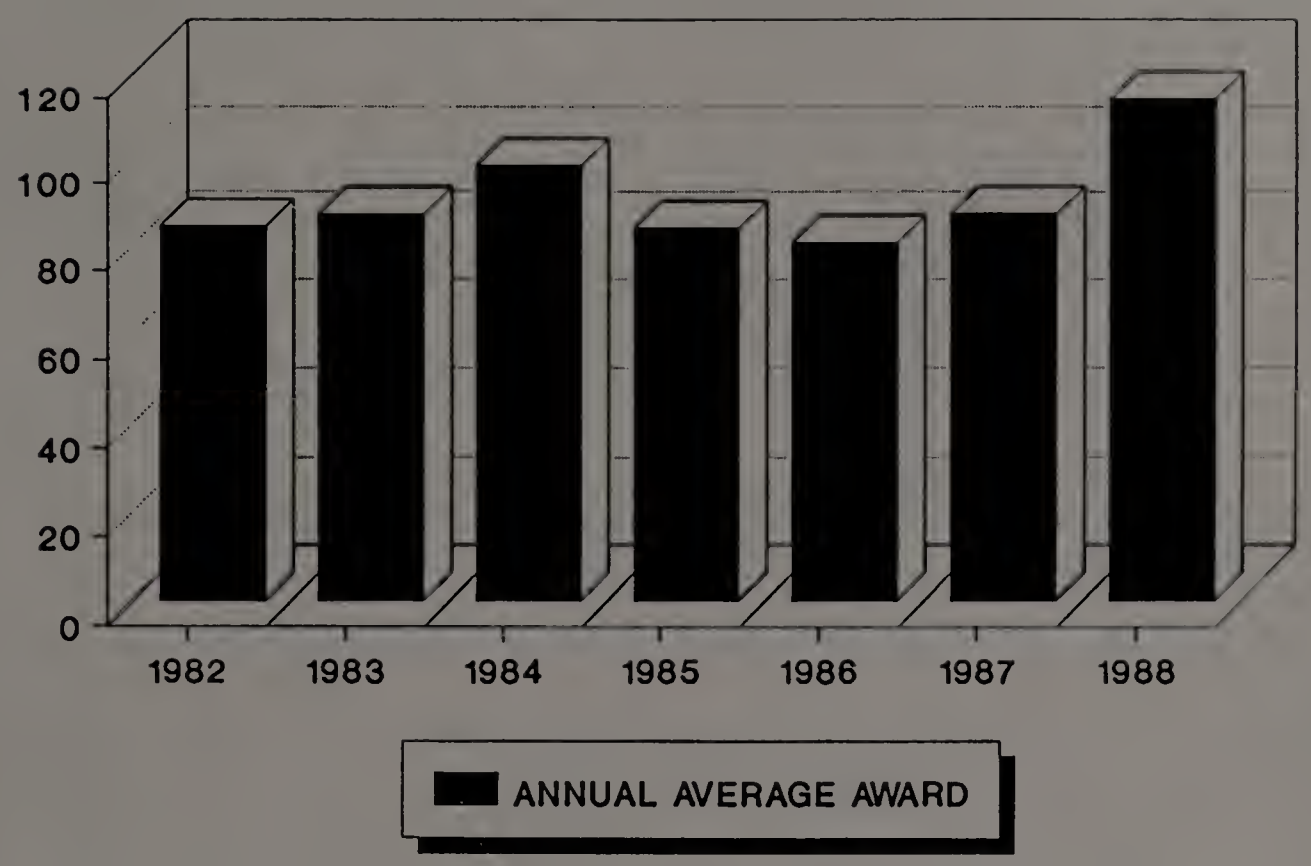

Figure 2. Mean Awards for Fellowships, Traineeships, and Training (1982-1988)

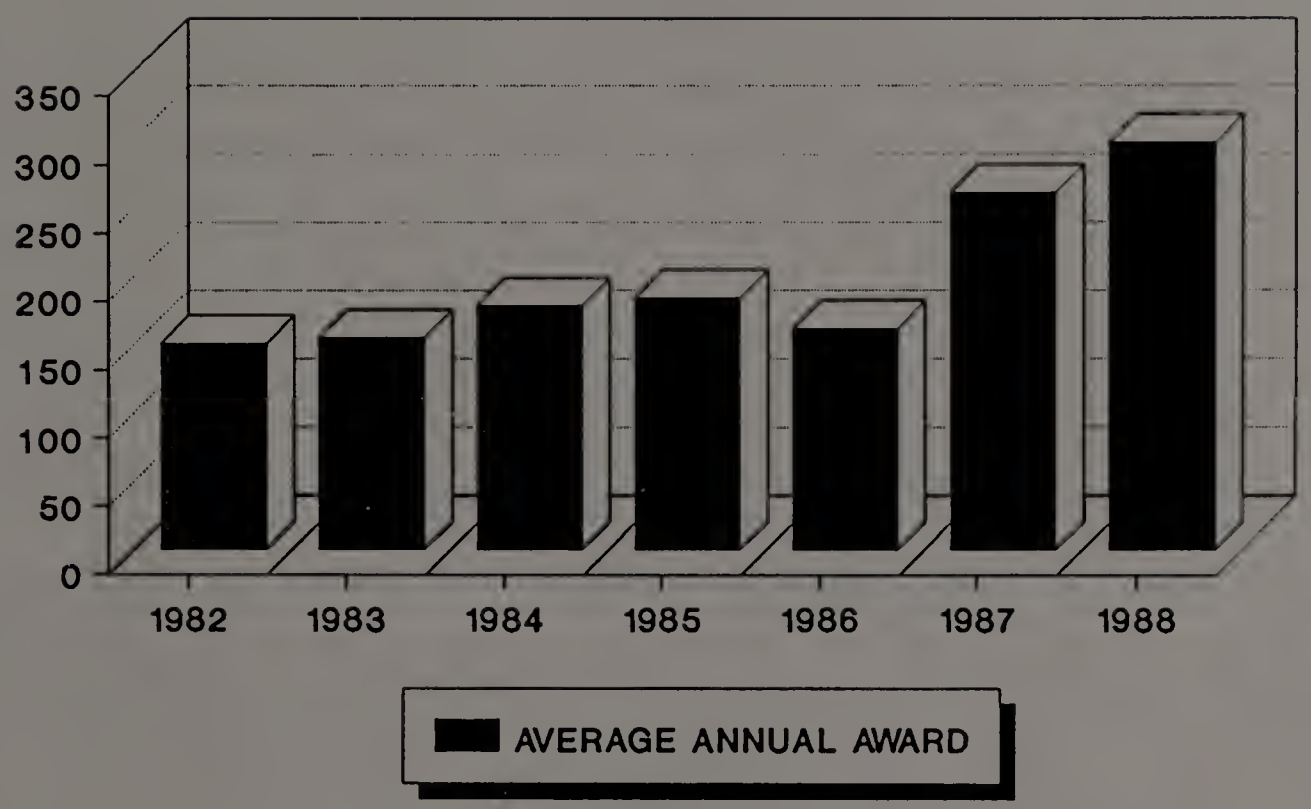

Figure 3. Mean General Support Awards (1982-1988)

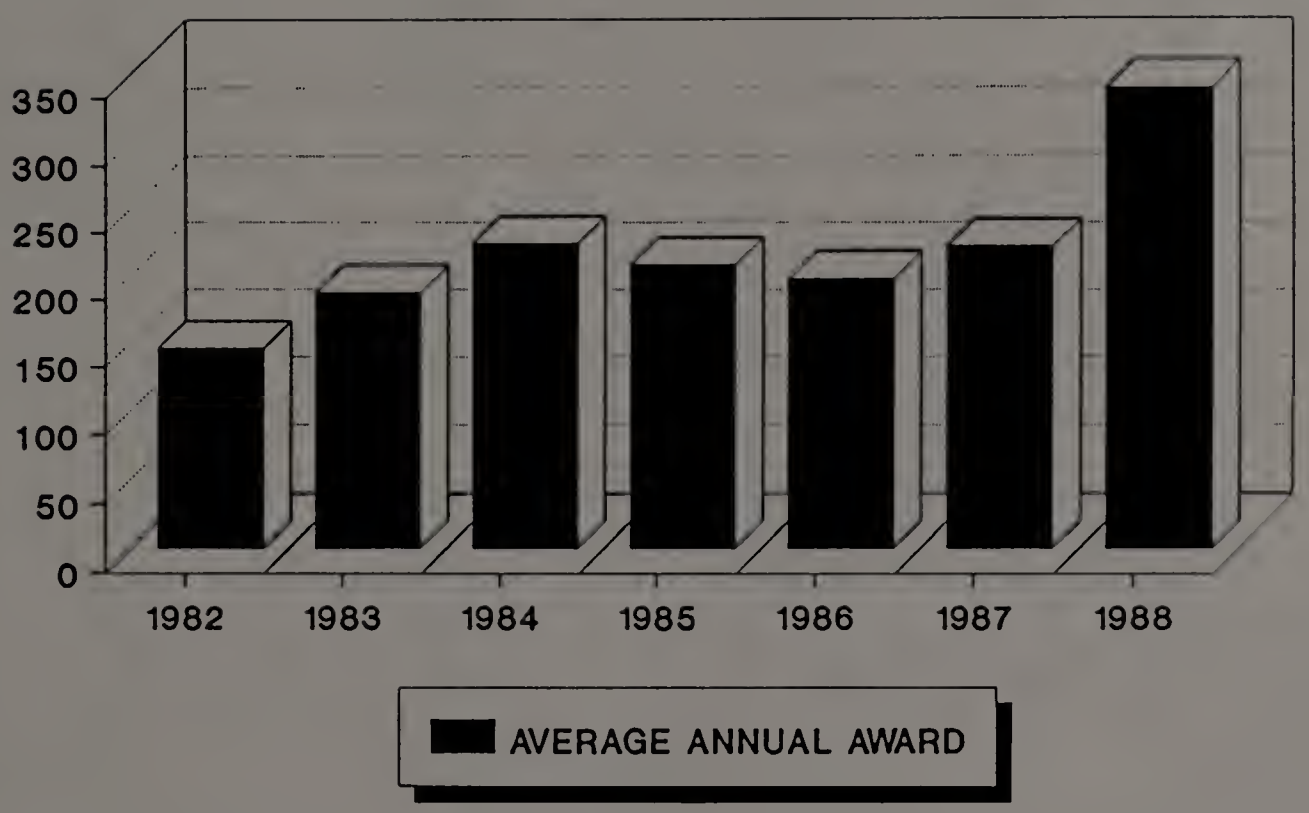

Figure 4. Mean Other Science and Engineering Awards (1982-1988)

For the Non-Science and Engineering factor, overall growth in dollar amount was not significant, i.e., there is less variation in Grant Awards from 1982 to 1988. However, Figure 5 shows an atypical pattern from 1982 to 1983. This pattern can be accounted for by the reductions in Pell Grants and Student Educational Opportunities Grants (SEOGs) in 1983, as reported by the U. S. Department of Education's Office of Student Financial Assistance.[1]

The data submitted in Figures 2 to 5 to address the question "What types of facilitating factors are related to historically Black colleges' and universities' growth and stability which are a consequence of HBCU leadership?" supports the selection of facilitating factors which are believed to be positively related to HBCU growth and stability. This study operates from the premise that these factors increase the capacity of historically Black colleges and universities to successfully compete for Federal R&D Grants and Contracts. The leadership factor is believed to be related to the decision to participate in Federal programs designed to strengthen HBCUs.

Test of the Major Hypotheses

The purpose of these hypotheses tests was to evaluate the importance of variables as they operate on successful R&D grantsmanship for historically Black colleges and

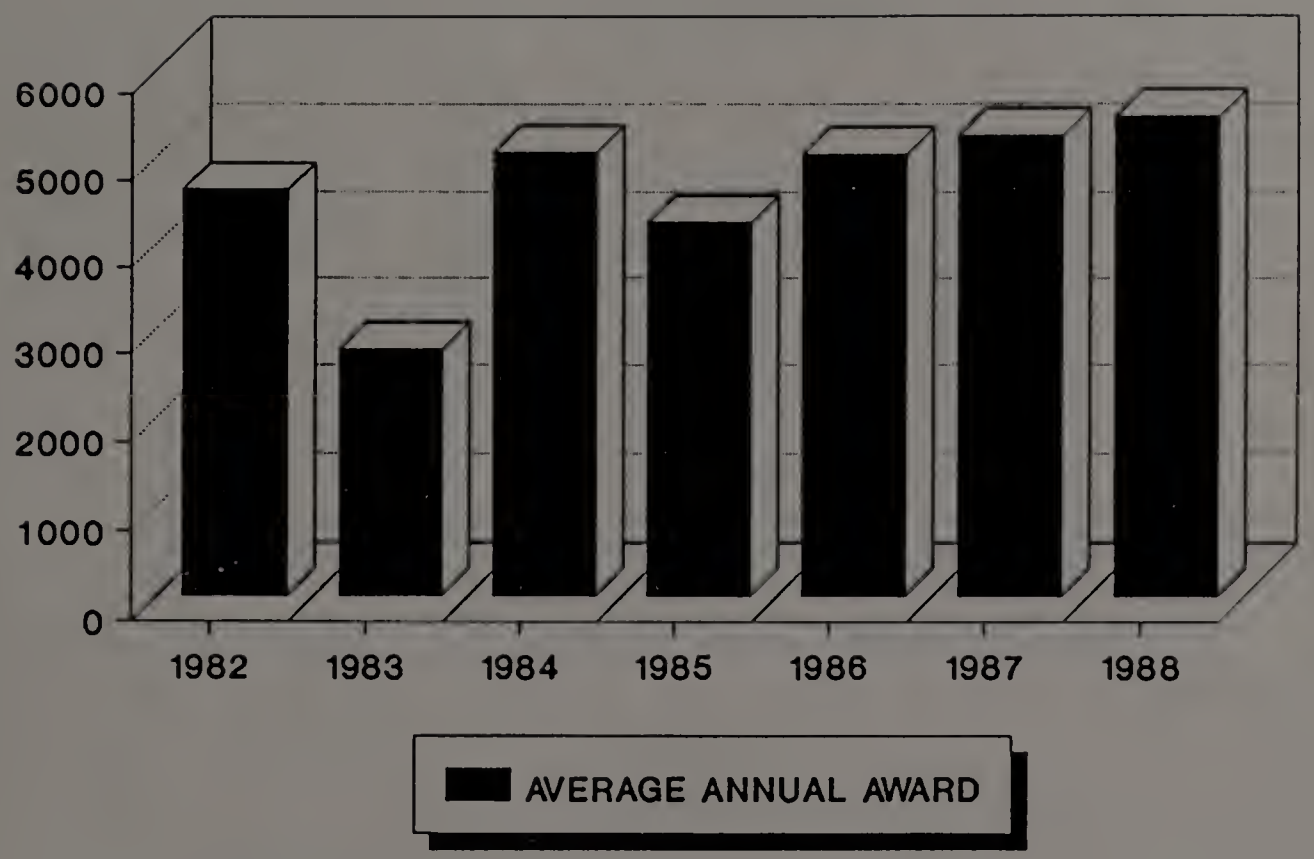

Figure 5. Mean Non-Science and Engineering Awards (1982-1988)

universities. Participation in the Federally-sponsored programs is designed to include only such acts as would be entirely voluntary on the part of HBCUs and still be unanimously (or nearly so) recommended as preferable to lack of taking these actions by educators, policymakers, and the academic community. Therefore, the variables evaluated in the hypotheses are not expected to be overshadowed by the influence of weak leadership. This gives the hypotheses the freedom to evaluate the variables strictly on their behavioral effect, if only on a small part of the total fund-raising/grantsmanship behavior, i.e., successful application for Federal Grants.

Hypothesis 1: The factors chosen for this study, when taken together, account for a large proportion of the variation in HBCU participation levels in Federal R&D Science and Engineering Programs.

Hypothesis 2: The variables listed as independent have strong relationships among themselves and can be grouped into component factors which give important information on the efforts of historically Black colleges and universities to expand their curriculum in

and relevance to the science
and engineering fields.

Tables 1 to 4 present correlation matrices to show the relationship between the four facilitating factors demonstrated to have an effect on HBCU participation level in Federally-sponsored R&D programs under the White House Initiative for Historically Black Colleges and Universities. Each of the four facilitating factors proved to be significantly correlated with R&D participation levels. It is interesting to note that during the early years, i.e., 1982-1985, the pattern of correlation coefficients tended to be lower than for the latter years, 1986-1988.

The factor which emerges as most important from a policy point of view is the measure of participation levels in Non-Science and Engineering. This category includes Title III, the Developing Institutions Initative (see Table 1).

The second most important factor is General Support in Science and Engineering. In this category, there are less restrictions on the Grant awards; they are primarily focused on improvements in academic departments, in general (see Table 2).

The third most important factor is Fellowships, Traineeships, and Training. A closer inspection of the correlation coefficients reveals that this factor tended to have more importance in the earlier years of the

Table 1

Correlation Matrix Relationship Between
R&D Grant Awards and Grant Awards for
Fellowships, Traineeships, and Training

	1982	1983	1984	1985	1986	1987	1988
1982	.78	.69	.76	.60	.73	.62	.57
1983	.76	.69	.74	.61	.69	.63	.57
1984	.78	.71	.75	.62	.73	.63	.57
1985	.84	.74	.78	.54	.76	.62	.61
1986	.80	.74	.76	.59	.76	.65	.60
1987	.77	.71	.73	.58	.75	.65	.60
1988	.72	.69	.69	.61	.71	.68	.61

Significance = .000
N = 87

Table 2

Correlation Matrix Relationship Between
R&D Grant Awards and General Support
in Science and Engineering

	1982	1983	1984	1985	1986	1987	1988
1982	.66	.75	.72	.73	.71	.68	.84
1983	.66	.74	.71	.72	.70	.70	.82
1984	.66	.73	.70	.72	.70	.68	.81
1985	.69	.80	.74	.77	.73	.73	.91
1986	.74	.78	.74	.88	.73	.73	.85
1987	.80	.81	.78	.78	.73	.77	.82
1988	.76	.73	.72	.72	.69	.72	.72

Significance = .000
N = 86

Initiative than the latter years. This suggests that the policy decision to include this category in the Initiative was a good one, in that it provided a clear indicator of effectiveness of Federal outreach and information dissemination (see Table 3).

The fourth most important factor is Other Science and Engineering. This factor focuses on factors similar to indicators of training and fellowships. Its unique focus is on grant awards related to student and faculty recruitment. Here the lower correlation coefficients can be accounted for by the fact that most of the grant opportunities in this area had to do with a focus on the life sciences. During the study years, the greatest opportunities were with the U. S. Department of Health and Human Services, National Institutes of Health programs for medical and biological programs (see Table 4).

All of the observed relationships are significant at the .000 probability level of significance. The results indicate that, indeed, several factors identified as under the control of the institution's administrator do have significant effects on the opportunity to participate in Federal programs designed to strengthen historically Black colleges and universities. The overall thesis which emerges from these findings is that universities can use, as one measure of the leadership effectiveness, the percentage of grants applied for and successfully received in specific

Table 3

Correlation Matrix Relationship Between
R&D Grant Awards and Grant Awards
for Other Sciences and Engineering

	1982	1983	1984	1985	1986	1987	1988
1982	.49	.49	.44	.50	.49	.51	.55
1983	.52	.52	.47	.53	.54	.55	.59
1984	.53	.53	.48	.56	.55	.56	.61
1985	.33	.33	.29	.35	.36	.36	.40
1986	.45	.45	.41	.48	.48	.49	.53
1987	.45	.45	.40	.48	.48	.48	.52
1988	.55	.56	.50	.59	.59	.59	.63

Significance = .000
N = 87

Table 4

Correlation Matrix Relationship Between
R&D Grant Awards and Grant Awards
for Non-Sciences and Engineering

	1982	1983	1984	1985	1986	1987	1988
1982	.83	.82	.84	.84	.83	.85	.88
1983	.77	.76	.79	.78	.77	.79	.79
1984	.77	.77	.79	.79	.79	.80	.80
1985	.88	.88	.88	.89	.88	.89	.89
1986	.76	.76	.77	.77	.76	.78	.78
1987	.71	.71	.72	.72	.71	.73	.73
1988	.60	.59	.61	.61	.60	.63	.63

Significance = .000
N = 87

areas consistent with the mission of the university. This criteria is used in measuring faculty effectiveness. These data provide strong credence because it suggests that changing some aspects of HBCU participation levels can have a significant impact on institutional and faculty status, stability, and viability. Furthermore, these observations provide non-refutable evidence of the success and relevance of the White House Initiative on Historically Black Colleges and Universities.

The analysis of the strengths of the factors which affect HBCU participation levels in Federally-sponsored R&D programs in science and engineering has brought results which have, to some extent, supported studies of the past, and has broken ground on concepts that have been formerly neglected or poorly treated in investigating the viability of historically Black colleges and universities. The group of variables labeled "predisposing" herein, to indicate how they effect the individual institutions in ways that the institutional leader is not expected to be able to effect, were not addressed at the level intended due to time and budgetary constraints on the researcher. However, further research needs to be directed on the impact of these factors as a measure of leadership effectiveness.

It is the facilitating factors which are the most important to the findings of this study. These findings help answer some questions and they give grounds to evaluate

the thesis that evaluation of growth and stability of institutions of higher learning can be made on their ability to secure needed resources and recruit and retain quality faculty and students, because the predisposing and facilitating factors of institutions of higher learning have been found to affect growth and stability significantly.

End Notes

[1]U. S. Government, Office of Management and Budget, Appendix to the Budget of the United States Government and Congressional Record, December 1983.

C H A P T E R VII

CONCLUSIONS, INTERPRETATIONS, AND RECOMMENDATIONS

Conclusions and Interpretations

Throughout the history of this country, higher education institutions have been a source of new ideas and innovations, and inventions for its citizens. For more than a century, the historically Black colleges and universities (HBCUs) have served as unique educational resources for minority students. In particular, the HBCUs have awarded approximately 30 percent of all degrees conferred to Black Americans. More than 85 percent of Black professionals, including doctors and lawyers, are alumni/ae of HBCUs. The relevancy of these historical institutions as significant contributors to the success of American growth and development in the area of higher education and particularly for Black Americans who enter the professional mainstream of society is of paramount importance. Towards this most essential and important goal of providing a natural, well-trained, and vital resource for the country, it is essential leadership and support systems of HBCUs develop, promote, and maintain effective strategies to ensure maximization of total effort to ensure their self-sufficiency.

In 1981, the Executive Branch of Government, under the leadership of President Ronald Reagan, established Executive Order 12320, which mandated specific Federal Government to increase their funding and infrastructure support for the HBCUs. The Executive Order maintained the establishment of a Federal program specifically designed to achieve significant increases in the participation of historically Black colleges and universities in Federally-sponsored programs. Further, President Reagan reiterated his support for the HBCUs when he stated, "We remain committed to the proposition that keeping historically Black colleges and universities as a vibrant force in American education should not be just the goal of Black Americans but of all of us."[1]

In a reaffirmation of the goals of self-sufficiency for the nation's Black institutions, President Reagan signed an amendment to Title III of the Higher Education Act, Challenge Grant Program, authorizing matching endowment grants to colleges and universities. This authorization was of particular importance to the continued Federal support of the historically Black colleges and universities.

The primary objective of this study was to evaluate factors related to HBCU participation levels in Federally-sponsored science and engineering programs. These factors are believed to be either aspects of individual institutions, their environment, their control authority,

leadership quality of policymakers, or features of the configuration of the Federally-sponsored programs. It is important that these factors be distinguished because the Federal Government can probably only address itself to those institutions who "self-elect" to participate. Those factors which are characteristic of HBCU policymakers and administrators will have to be changed by developments within other systems or through a larger system outlook.

A second objective was to provide insights on policy issues relating to the benefits of certain configurational alternatives. Within each of the participating Federal agencies, HBCU programs are uniquely structured. Such a practice led the National Association for Equal Opportunity in Higher Education (NAFEO) to make specific recommendations addressing the concern of how HBCU systems supports could be configured. In a report by its National Advisory Committee, six systems support areas were identified and discussed: (1) Federal Policy Toward Black Colleges; (2) Research; (3) Human Resources; (4) Socioeconomic Issues; (5) Planning; and (6) Monitoring and Evaluating.[2]

The most important aspect of this study was to explore the separability and testability of the identified factors in HBCU participation levels in Federal science and technology programs. Such an approach should lend future researchers and planners in the direction of more careful

use of assumptions about the nature of HBCU participation, in Federally-sponsored science and engineering programs.

It was not possible to include all factors of HBCU participation in Federal R&D science and engineering programs in this study. Therefore, the study concentrated on two specific treatments of the variables. First, the variables selected, especially those which were operated by Federal policy planners, were conceptually related to growth and stability of Black institutions of higher education. It was also necessary, as a second step, to discover the extent to which the variables that constitute the independent set are related to one another. Together, these reflect on the validity of employing the proportion of HBCUs which have achieved growth and stability as a criterion for evaluating a Federally-sponsored program.

The first two hypotheses are a reflection of the expectation that the choice of variables was appropriate and that one particular group predominates. The remaining hypotheses were general postulations deduced from the literature. Just as important as the strength of the group of variables is the extent to which they are interrelated. When several variables act in concert, there is a strong possibility that efforts to affect the dependent variables by changing one factor will be confounded by the stability of others which related to it. The finding suggests that the Federal support in non-academic science

and engineering programs did in fact serve as facilitating factors in enhancing the potential and competitiveness of the HBCUs.

The ability of the theoretical model to explain HBCU participation levels in Federal R&D science and engineering programs was an important consideration of this study. However, a more important consideration concerns the implications of the ability to separate the model into predisposing conditions and facilitating factors. Predisposing conditions are characteristics of the institutions under study, while facilitating factors are the consequences of the Federal policy and initiatives to strengthen HBCUs.

Despite overall Federal Government spending constraints, the performance and involvement of HBCUs in non-science, academic science, and engineering have increased significantly. There has been extensive effort by the Federal Government and the private sector to promote and support greater active participation of HBCUs in science and non-science programs. The involvement of private sector corporations, businesses, and foundations has complimented the Federal Government's participation in support of the HBCUs, which, in effect, has resulted in strengthening the capabilities and competitiveness of the HBCUs. Evidence to support this observation includes an increase in institutional course offerings and an increase

in the number of new faculty members with more technical preparation in science and engineering educational backgrounds. The net effect of HBCU growth and stability can be seen in the area of escalating student enrollment.

The Federal Government has taken a major leadership position in support of the historically Black colleges and universities by increasing Federal funds to support academic programs, buildings, and other educational facilities at HBCUs. Additionally, special programs to increase science and engineering were developed, spurred, and supported by the Federal Government. The Department of Education's Minority Institutional Science Program and the Title III Developing Institutions Program are primary examples of this support. These efforts have encouraged HBCU administrators exertion in expanding their leadership roles to increase curriculum development at the HBCUs. Under the leadership of HBCU administrators, research development officers have successfully competed for and obtained funding grants to develop science and engineering projects and have consequently become active in Federally-sponsored faculty development programs, conferences, and workshops. These special faculty have been significant in improving the quality of educational science and engineering learning programs for Black students at historically Black colleges and universities and are an indication of the quality of administrative leadership.

The results of the case studies provide evidence of HBCU growth and stability over the past eight years. The data suggest that the HBCUs, which received the greatest amount of Federal funding in both the science areas, were also more likely to have received the greatest amount of funding in non-science academic areas. The impact of these observations is reflected in expanded academic curriculum offerings and enhanced physical facilities. In other words, facilitating factors (i.e., higher levels of participation in developmental grant programs) tended to lead to a higher probability of the awards of research and development funds in science and engineering programs.

While substantial progress has been made in equalizing educational opportunity, providing financial assistance for postsecondary education, and facilitating economic advancement for a significant percentage of the nation's Black populace, the plight of the HBCUs remains severe. Many of the HBCUs continue to be plagued by isolation from the academic mainstream, inadequate or nonexistent endowments, and insignificant amounts of Federal assistance. In the eyes of many, the survival of the HBCUs is directly proportional to the amount of Federal assistance these institutions can secure.

Overall during the 1990s, HBCUs continued to experience a decline in institutional resources and student enrollment.

The leadership of HBCUs must now employ innovative approaches in maintaining quality academic instruction and curriculum, and develop aggressive student and faculty recruitment activities.

Recent literature documents the fact that reduced faculty turnover and budget problems limit HBCUs' ability to attract and hire new faculty. Admittedly, new programs increase institutional flexibility during periods of decline in enrollment. However, a focus only on growth in science and engineering programs can be viewed as inadequate.

Quality faculty members have undergone long periods of formal academic training and socialization. Consequently, they enter the professional ranks with the expectation of job security and stability, tenure, status, and systematic upward and lateral mobility within the academic community. However, because of the decline in student enrollment, HBCU faculty are faced with the prospect of having their tenured or tenure-eligible positions eliminated.

Recommendations

The following addresses recommendations for the governing boards, administrators, faculty, and future researchers of historically Black colleges and universities. The

Federal Government, in support of the nation's science and technological needs, must sustain and increase programs geared to improving science and mathematics curricula in historically Black colleges and universities. The programs supported by the Federal Government should be developed to increase Black participation in scientific and technical professionals.

Meaningful faculty development programs in the area of science and engineering should be incorporated as part of the personal development component of faculty development. Comprehensive and thorough research is needed to test the appropriateness and new academic program offerings which support the quality of learning, institutional development, and enrollment growth of HBCUs. The results of this extensive effort should unquestionably be used as a means to support the continued development and growth of historically Black colleges and universities in future science and technology evolutionary areas.

Although it is generally accepted that sustained Federal Government effort is needed to assist HBCUs in their goals of obtaining self-sufficiency, i.e., to increase their level of participation in Federally-sponsored programs, HBCUs must actively promote dialogue among themselves to address the issues of increased growth and development. In an effort to insure the survival of HBCUs during periods of Federal Government fiscal restraint,

HBCU administrators, faculty, and governing boards should consider developing cooperative relationships and linkages between other HBCUs, non-HBCU institutions, and private sector organizations. HBCU administrators should consider sharing their existing institutional resources, including administrative personnel, faculty, facilities, and equipment, by functioning in partnership and joint venture agreements not only to strengthen HBCUs' academic course offerings in science and engineering programs but to foster growth and advancement.

The significant contribution of historically Black colleges and universities can be documented by accomplishments of Black professionals who contribute substantially to American society. More than 80 percent of the nation's Black judges, 75 percent of Black military officers, 60 percent of Black pharmacists, and 50 percent of Black engineers received their degrees from historically Black colleges. HBCUs continue to award more than one-third of all baccalaureate degrees earned by Black Americans. The chronology of HBCU academic and social development for Black students has been well-established. The need for HBCUs to continue to educate this nation's Black students is paramount. The Executive Order signed by President George Bush in 1988 and as currently implemented offers tremendous potential for strengthening the historically Black colleges and universities and advances in science and engineering programs.

End Notes

[1]Leonard H. O. Spearman, "Federal Roles and Responsibilities Relative to the Higher Education of Blacks Since 1967," Journal of Negro Education 50(3), (1981): 285-298.

[2]National Advisory Committee on Black Higher Education and Black Colleges and Universities, Needed Systems Supports for Achieving Higher Education Equity for Black Americans (Washington, D. C.: U. S. Government Printing Office, November 1980).

APPENDICES

APPENDIX A:

LISTING OF
HISTORICALLY BLACK COLLEGES AND UNIVERSITIES

LISTING OF HISTORICALLY BLACK COLLEGES AND UNIVERSITIES

State and Institution	Year Established	Control	Level
ALABAMA			
Alabama A & M University Normal	1875	Public	4
Alabama Lutheran Academy and College Selma	1922	Private	2
Alabama State University Montgomery	1874	Public	4
*Daniel Paine College Birmingham	1889	Private	4
Lawson State Community College Birmingham	1965	Public	2
Lomax-Hannon Junior College Greenville	1893	Private	2
Miles College Birmingham	1905	Private	4
Oakwood College Huntsville	1896	Private	4

State and Institution	Year Established	Control	Level
ALABAMA (Continued)			
S. D. Bishop State Junior College Mobile	1965	Public	2
Selma University Selma	1878	Private	4
Stillman College Tuscaloosa	1876	Private	4
Talladega College Talladega	1867	Private	4
Tuskegee Institute Tuskegee Institute	1881	Private	4
ARKANSAS			
Arkansas Baptist College Little Rock	1901	Private	4
Philander Smith College Little Rock	1877	Private	4
Shorter College Little Rock	1886	Private	2
University of Arkansas at Pine Bluff Pine Bluff	1873	Public	4

State and Institution	Year Established	Control	Level
DELAWARE			
Delaware State College Dover	1891	Public	4
DISTRICT OF COLUMBIA			
University of the District of Columbia Washington	1851	Public	4
Howard University Washington	1867	Private	4
FLORIDA			
Bethune-Cookman College Daytona Beach	1872	Public	4
Edward Waters College Jacksonville	1866	Private	4
Florida A & M University Tallahassee	1887	Public	4
Florida Memorial College Miami	1879	Private	4

State and Institution	Year Established	Control	Level
GEORGIA			
Albany State College Albany	1903	Public	4
Atlanta University Atlanta	1865	Private	4
Clark College Atlanta	1869	Private	4
Fort Valley State College Fort Valley	1895	Public	4
Interdenominational Theological Center Atlanta	1958	Private	4
Morehouse College Atlanta	1867	Private	4
Morehouse School of Medicine Atlanta	1975	Private	4
Morris Brown College Atlanta	1881	Private	4
Paine College Augusta	1882	Private	4

State and Institution	Year Established	Control	Level
GEORGIA (Continued)			
Savannah State College Savannah	1890	Public	4
Spellman College Atlanta	1881	Private	4
KENTUCKY			
Kentucky State University Frankfort	1886	Public	4
LOUISIANA			
Dillard University New Orleans	1869	Private	4
Grambling State University Grambling	1901	Public	4
Southern University A & M College/ Main Campus Baton Rouge	1880	Public	4
Southern University-New Orleans New Orleans	1956	Public	4

State and Institution	Year Established	Control	Level
LOUISIANA (Continued)			
Southern University/ Shreveport-Bossier City Campus Shreveport	1964	Public	2
Xavier University of Louisiana New Orleans	1915	Private	4
MARYLAND			
Bowie State College Bowie	1865	Public	4
Coppin State College Baltimore	1900	Public	4
Morgan State University Baltimore	1867	Public	4
University of Maryland/ Eastern Shore Princess Anne	1886	Public	4
MISSISSIPPI			
Alcorn State University Lorman	1871	Public	4

State and Institution	Year Established	Control	Level
MISSISSIPPI (Continued)			
Coahoma Junior College Clarksdale	1949	Public	4
Jackson State University Jackson	1877	Public	4
Mary Holmes College West Point	1892	Private	2
*Mississippi Industrial College Holly Springs	1905	Private	4
Mississippi Valley State University Itta Bena	1946	Public	4
*Natchez Junior College Natchez	1884	Private	2
*Prentiss Normal and Industrial College Prentiss	1907	Private	2
Rust College Holly Springs	1866	Private	4
Tougaloo College Tougaloo	1869	Private	4

State and Institution	Year Established	Control	Level
MISSISSIPPI (Continued)			
Utica Junior College Utica	1954	Public	2
MISSOURI			
Lincoln University Jefferson City	1866	Public	4
NORTH CAROLINA			
Barber-Scotia College Concord	1867	Private	4
Bennett College Greensboro	1873	Private	4
Elizabeth City State University Elizabeth City	1891	Public	4
Fayetteville State University Fayetteville	1877	Public	4
Johnson C. Smith University Charlotte	1867	Private	4
Livingstone College Salisbury	1879	Private	4

State and Institution	Year Established	Control	Level
NORTH CAROLINA (Continued)			
North Carolina A & T State University Greensboro	1891	Public	4
North Carolina Central University Durham	1910	Public	4
Shaw University Raleigh	1865	Private	4
St. Augustine's College Raleigh	1867	Private	4
Winston-Salem State University Winston-Salem	1892	Public	4
OHIO			
Central State University Wilberforce	1887	Public	4
Wilberforce University Wilberforce	1856	Private	4

State and Institution	Year Established	Control	Level
OKLAHOMA			
Langston University Langston	1897	Public	4
PENNSYLVANIA			
Cheyney State College Cheyney	1837	Public	4
Lincoln University Lincoln University	1854	Public	4
SOUTH CAROLINA			
Allen University Columbia	1870	Private	4
Benedict College Columbia	1870	Private	4
Claflin College Orangeburg	1869	Private	4
Clinton Junior College Rock Hill	1894	Private	2
Friendship Junior College Rock Hill	1891	Private	2

State and Institution	Year Established	Control	Level
SOUTH CAROLINA (Continued)			
Morris College Sumter	1908	Private	4
South Carolina State College Orangeburg	1896	Public	4
Voorhees College Denmark	1897	Public	4
TENNESSEE			
Fisk University Nashville	1867	Private	4
Knoxville College Knoxville	1863	Private	4
Lane College Jackson	1882	Private	4
LeMoyne-Owen College Memphis	1870	Private	4
Meharry Medical College Nashville	1876	Private	4
Morristown College Morristown	1881	Private	2

State and Institution	Year Established	Control	Level
TENNESSEE (Continued)			
Tennessee State University Nashville	1912	Public	4
TEXAS			
Bishop College Dallas	1881	Private	4
Huston-Tillotson College Austin	1877	Private	4
Jarvis Christian College Hawkins	1912	Private	4
Paul Quinn College Waco	1872	Private	4
Prairie View A & M University Prairie View	1876	Public	4
Southern Christian College Terrell	1949	Private	2
Texas College Tyler	1894	Private	4
Texas Southern University Houston	1947	Public	4

State and Institution	Year Established	Control	Level
TEXAS (Continued)			
Wiley College Marshall	1873	Private	4
VIRGINIA			
Hampton University Hampton	1868	Private	4
Norfolk State University Norfolk	1935	Public	4
St. Paul's College Lawrenceville	1888	Private	4
Virginia College Lynchburg	1886	Private	2
Virginia State College Petersburg	1882	Public	4
Virginia Union University Richmond	1865	Private	4
WEST VIRGINIA			
Bluefield State College Bluefield	1895	Public	4

State and Institution	Year Established	Control	Level
WEST VIRGINIA (Continued)			
West Virginia State College Institute	1891	Public	4

SOURCE: The National Association for Equal Opportunity in Higher Education, Washington, D. C.

*Includes HBCU institutions closed due to loss of enrollment, funding, and/or accreditation.

APPENDIX B:

CASE STUDIES OF SELECTED HISTORICALLY BLACK COLLEGES AND UNIVERSITIES

Historically Black colleges and universities (HBCUs) are those institutions founded primarily for Black Americans. Most of these are 50 to 100 years old. Of the 106 HBCUs, 61 are private (both church affiliated and secular) and 45 are public institutions. They are located in 15 states, predominantly in the Southeast. They range in size from small junior and four-year colleges with fewer than 500 students to universities with graduate and professional schools with enrollments of more than 10,000 students. In 1980, HBCUs enrolled approximately 218,000 students of which about 90 percent were Black Americans.

These colleges and universities face most of the problems confronting all institutions of higher education, such as Federal influence, decreasing enrollment, curriculum relevance, and faculty/staff unionization, as well as limited financial resources. Before the passage of the Higher Education Act of 1965 and its amendments, Black colleges and universities received minimal support from the Federal Government. This legislation includes, among other titles, Title III--"Strengthening Developing Institutions"--which was widely interpreted at that time as a direct intercession favoring Black colleges and universities and as a Federal commitment to their survival and enhancement. This legislation, along with other programs under the Economic Opportunity Act of 1964 and certain student

financial aid programs, was constructed to be contributing elements in the Federal effort to counteract the historical effects of racial inequality and discrimination.

A review of the grant awards history reveals that most of the awards by Federal agencies have been made to institutions with graduate programs. Of the 106 HBCUs in the United States, less than 20 have science, computer science, and engineering graduate programs, while about 80 percent are liberal arts undergraduate institutions. In order for HBCUs to become competitive with other institutions of higher education, as well as to offer quality education, an academic research atmosphere is an important prerequisite.

The case studies listed herein identify twenty historically Black colleges and universities that excel in the areas of science and technology. The list is limited to those institutions that receive the greatest amount of Federal funds in science and technology programs.

CASE STUDIES OF SELECTED HISTORICALLY BLACK COLLEGES AND UNIVERSITIES

1. Atlanta University (Atlanta, Georgia)
2. Florida A & M University (Tallahassee, Florida)
3. Hampton University (Hampton, Virginia)
4. Howard University (Washington, D. C.)
5. Jackson State University (Jackson, Mississippi)
6. Kentucky State University (Frankfort, Kentucky)
7. Langston University (Langston, Oklahoma)
8. Lincoln University (Jefferson City, Missouri)
9. Lincoln University (Lincoln University, Pennsylvania)
10. Meharry Medical College (Nashville, Tennessee)
11. Morehouse School of Medicine (Atlanta, Georgia)
12. North Carolina Agricultural and Technical State University (Greensboro, North Carolina)
13. Prairie View A & M University (Prairie View, Texas)
14. Southern University-Baton Rouge (Baton Rouge, Louisiana)
15. Southern University-New Orleans (New Orleans, Louisiana)
16. Spelman College (Atlanta, Georgia)
17. Tuskegee University (Tuskegee, Alabama)
18. Univeristy of Arkansas (Pine Bluff, Arkansas)
19. Virginia State University (Petersburg, Virginia)
20. Xavier University (New Orleans, Louisiana)

ATLANTA UNIVERSITY

ATLANTA, GEORGIA

1. MISSION: Atlanta University is located less than two miles from the heart of the city of Atlanta. It is the oldest predominantly Black graduate school in the nation and is responsible for graduate and professional education in the Atlanta University Center Consortium. The University was chartered in 1967 and is composed of five schools: the Schools of Arts and Sciences, School of Business Administration, School of Education, School of Library and Information Studies, and the School of Social Work. The University is nonsectarian independent, and its ongoing goal has been complete education for a whole life.

2. YEAR FOUNDED: 1865

3. TYPE OF CONTROL: Private

4. TYPE OF INSTITUTION: Graduate Degree Programs

5.	PRESIDENTS' HIGHEST DEGREES:	1981: Ph.D.	1988: Ph.D.
6.	AREAS OF DEGREES:	Physiology	Engineering
7.	STUDENT ENROLLMENT:	1,082	1,065

8. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES:

1981	1988
Library Services	Library Services
Accounting	Accounting
Policy Studies	Policy Studies
Afro-American Studies	Afro-American Studies
Mathematics	Mathematics
Biology	Biology
Chemistry	Chemistry
Computer Science	Computer Science
Criminal Justice	Criminal Justice
Decision Science	Decision Science
Education	Education
Psychology	Psychology
English	English
Finance	Finance
Languages	Languages
Health Service	Health Service

8. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES (Continued):

1981	1988
History	History
Humanities	Humanities
Management	Management
Marketing	Marketing
Physics	Physics
Political Science	Political Science
P Administration	P Administration
Sociology	Sociology
Anthropology	Anthropology
	Criminal Justice
	E Administration
	Government
	Pure Mathematics

FLORIDA AGRICULTURAL AND MECHANICAL UNIVERSITY

TALLAHASSEE, FLORIDA

1. MISSION: Florida A & M University is a coeducational land-grant institution, founded in 1887. The University is comprised of 419 acres of land with physical facilities valued at $70 million. Florida A & M, a multi-purpose university, is a unit of the nine-member Florida State University System. The University's academic component consists of seven schools and colleges. A new School of Applied Health Sciences opened in 1981. Florida A & M's principal role is to provide education and experiences for students with career ambitions and who are aiming for positions in business, industry, and professions. Through its ten schools and colleges, it provides a broad program of academic training, research, and community services.

2. YEAR FOUNDED: 1887

3. TYPE OF CONTROL: Public

4. TYPE OF INSTITUTION: 4-Year Baccalaureate Degree and Graduate Degree Programs

5. PRESIDENTS' HIGHEST DEGREES: 1981: M.Ed. 1988: Ph.D.

6. AREAS OF DEGREES: Education Chemistry

7. STUDENT ENROLLMENT: 4,646 5,169

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES:

1981	1988
Accounting	Accounting
Afro-American Studies	Afro-American Studies
Architecture	Architecture
Education	Education
Biology	Biology
Business	Business
Chemistry	Chemistry
Engineering	Engineering
Data Processing	Data Processing
Economics	Economics
English	English
Entomology	Entomology

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES (Continued):

1981	1988
Graphic Arts	Graphic Arts
Technology	Technology
History	History
Journalism	Journalism
Marketing	Marketing
Mathematics	Mathematics
Music	Music
Nursing	Nursing
Horticulture	Horticulture
Landscape Design	Landscape Design
Pharmacy	Pharmacy
Philosophy	Philosophy
Religion	Religion
Physics	Physics
Sociology	Sociology
Social Studies	Social Studies
	Applied Health
	Health Sciences
	Nursing
	Life Sciences
	Political Science
	Visual Arts
	Construction

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES:

1981	1988
Education	Education
Architecture	Architecture
Business	Business
Social Sciences	Social Sciences
Psychology	Psychology
English	English
Pharmacy	Pharmacy
Counseling	Counseling
	Industrial Arts Education

HAMPTON UNIVERSITY

HAMPTON, VIRGINIA

1. MISSION: Hampton University is Virginia's only coeducational, non-denominational four-year private university. Hampton University was founded in 1868; prepares students to make definite contributions to society in professional competence, character, and useful citizenship. The institution has solid, undeniable academic strength. Its unique program offerings include Architecture, Engineering, Radio, Television, Print Journalism, Communication Disorders, Computer Science and Marine Science.

2. YEAR FOUNDED: 1868

3. TYPE OF CONTROL: Private

4. TYPE OF INSTITUTION: 4-Year Baccalaureate Degree and Graduate Degree Programs

5. PRESIDENTS' HIGHEST DEGREES: 1981: Ed.D. 1988: Ed.D.

6.	AREAS OF DEGREES:	Education	Education
7.	STUDENT ENROLLMENT:	4,063	6,252

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES:

1981	1988
Criminal Justice	Criminal Justice
Naval Science	Naval Science
Business	Business
Accounting	Accounting
Finance	Finance
Architecture	Architecture
Art Education	Art Education
Biological Sciences	Biological Sciences
Education	Education
Physics	Physics
English	English
History	History
Philosophy	Philosophy
Religion	Religion
Human Ecology	Human Ecology
Marine Science	Marine Science

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES (Continued):

1981	1988
Environmental Studies	Environmental Studies
Mathematics	Mathematics
Computer Science	Computer Science
Music	Music
Nursing	Nursing
Political Science	Political Science
Psychology	Psychology
Sociology	Sociology
Social Work	Social Work
Construction Technology	Construction Technology
	Applied Sciences

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES:

1981	1988
Administration	Administration
Nursing	Nursing
Guidance	Guidance
Counseling	Counseling
Business Administration	Business Administration
Education	Education
Museum Studies	Museum Studies
Biology	Biology
Chemistry	Chemistry
Physics	Physics

HOWARD UNIVERSITY

WASHINGTON, D. C.

1. MISSION: Howard University is a coeducational, private institution of higher learning founded by an Act of Congress in 1867. Howard University consists of 17 fully accredited colleges and schools with doctorates awarded in 28 fields, approximately 87 major graduate and professional programs and 95 major undergraduate programs. Howard University operates a 500-bed teaching hospital and medical center which attracts patients from many parts of the world. The University owns a commercial radio station which serves as laboratories for the School of Communications and it sponsors the Howard University Press. The institution's special commitment to the education of Blacks and other minorities is reflected in the focus of its program to develop skilled professionals and trained scholars, with the ability and sensitivity to move society into closer harmony with a concept of social justice.

2. YEAR FOUNDED: 1867

3. TYPE OF CONTROL: Private

4. TYPE OF INSTITUTION: 4-Year Baccalaureate Degree and Graduate Degree Programs

	1981:	1988:
5. PRESIDENTS' HIGHEST DEGREES:		
6. AREAS OF DEGREES:	Theology	Theology
7. STUDENT ENROLLMENT:	11,594	10,986

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES:

1981	1988
Fine Arts	Fine Arts
Architecture	Architecture
Business Administration	Business Administration
City Planning	City Planning
Engineering	Engineering
Computer Systems	Computer Systems
Medical Dietetics	Medical Dietetics
Nursing	Nursing
Occupation Therapy	Occupation Therapy

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES (Continued):

1981	1988
Radiologic Technology	Radiologic Technology
Social Work	Social Work
Medical Technology	Medical Technology
Education	African Studies
Physical Sciences	Afro-American Studies
	Anatomy
	Biochemistry
	Physical Sciences
	City Planning
	Communication Arts
	Computer Science
	Classics
	Education
	Hotel Management
	Zoology

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES:

1981	1988
Master of Arts	African Studies
Science	Science
Architecture	Architecture
Business Administration	Business Administration
Communication Arts	Communication Arts
Economics	Economics
Teaching	Teaching
Social Work	Social Work
Nursing	Nursing
Music Education	Music Education
Engineering	Engineering
Divinity	Divinity
Education	Education
Philosophy	Philosophy
Pharmacy	Pharmacy
Medicine	Medicine
Juris Doctor	Juris Doctor
Dental Surgery	Dental Surgery
	Biochemistry
	Communication Arts
	Languages
	Mathematics
	Microbiology
	Physics
	Psychology
	Zoology

JACKSON STATE UNIVERSITY

JACKSON, MISSISSIPPI

1. MISSION: Jackson State University, founded in 1877, is widely recognized as a growing progressive institution. Jackson State University was recently designated as one urban university of the Mississippi State University System, and it continues to provide teaching, research, service, and leadership in higher education for the people in the community, state, and nation. Jackson State University has five schools: Education, Science and Technology, Liberal Studies, Business, and the Graduate School. The University is supported by legislative appropriations supplemented by student fees, and federal and private grants.

2. YEAR FOUNDED: 1877

3. TYPE OF CONTROL: Public

4. TYPE OF INSTITUTION: 4-Year Baccalaureate Degree and Graduate Degree Programs

5.	PRESIDENTS' HIGHEST DEGREES:	1981: Ph.D.	1988: Ph.D.
6.	AREAS OF DEGREES:	Economics	Economics
7.	STUDENT ENROLLMENT:	6,523	6,503

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES:

1981	1988
Education	Education
Economics	Economics
Languages	Languages
Geography	Geography
History	History
Social Sciences	Social Sciences
Political Science	Political Science
Physics	Physics
Mathematics	Mathematics
Business	Business
Criminal Justice	Criminal Justice
Correctional Services	Correctional Services
	Journalism
	Medical

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES (Continued):

1981	1988
	Life Sciences
	Military Sciences
	Psychology
	Public Affairs
	Allied Health
	Health Sciences
	Urban Studies

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES:

1981	1988
Education	Education
Administration	Administration
Special Education	Special Education
Recreation	Recreation
Biology	Biology
Chemistry	Chemistry
English	English
Political Science	Political Science
	Accounting
	Computer Science
	Communication
	Social Work
	History
	Sociology
	Health Education
	Student Services

KENTUCKY STATE UNIVERSITY

FRANKFORT, KENTUCKY

1. MISSION: Kentucky State University is a coeducational, land-grant college. From its commencement was the only public higher education opportunity in Kentucky for Black Kentuckians. It has extensive community education programs and a graduate center, which offers Kentucky State University and other universities Master's Degree programs. Kentucky State University is accredited by the Southern Association of Colleges and Schools, and has accredited Social Work, Teacher Education, Nursing, and Music programs.

2. YEAR FOUNDED: 1886

3. TYPE OF CONTROL: Public

4. TYPE OF INSTITUTION: 4-Year Baccalaureate Degree and Graduate Degree Programs

5. PRESIDENTS' HIGHEST DEGREES: 1981: Ed.D. 1988: J.D.

6. AREAS OF DEGREES:	Education	Law
7. STUDENT ENROLLMENT:	2,431	3,100

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES:

1981	1988
Business Administration	Business Administration
Mathematics	Mathematics
Education	Education
Computer Science	Computer Science
Criminal Justice	Criminal Justice
English	English
History	History
Liberal Studies	Liberal Studies
Manufacturing Technology	Manufacturing Technology
Physiology	Physiology
Microcomputers	Microcomputers
Political Science	Political Science
Textiles	Textiles
Clothing Merchandising	Clothing Merchandising
Medical Technology	Medical Technology
	Real Estate Marketing

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES (Continued):

1981	1988
	Data Processing
	Engineering
	Electronic Technology
	Health Science
	Law Enforcement

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES:

1981	1988
Public Affairs	Public Affairs

LANGSTON UNIVERSITY

LANGSTON, OKLAHOMA

1. MISSION: Langston University is an integral part of the Oklahoma State System of Higher Education. It is one of the land-grant colleges in the State of Oklahoma. The University has a special land-grant mission, which is to provide educational opportunities for urban residents and to train and fully educate citizens for living, working, and coping with the realities of the urban society.

2. YEAR FOUNDED: 1897

3. TYPE OF CONTROL: Public

4. TYPE OF INSTITUTION: 4-Year Baccalaureate Degree and Graduate Degree Programs

5. PRESIDENTS' HIGHEST DEGREES: 1981: Ed.D. 1988: Ed.D.

6. AREAS OF DEGREES: Education Education

7. STUDENT ENROLLMENT: 1,856 3,000

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES:

1981	1988
Education	Education
Business Administration	Business Administration
Economics	Economics
Social Science	Social Science
Psychology	Psychology
History	History
Physical Sciences	Physical Sciences
Journalism	Journalism
English	English
Mathematics	Mathematics
English	English
Mathematics	Mathematics
Allied Health	Allied Health
Agriculture	Agriculture
	Communication
	Law Enforcement
	Industrial Technology
	Nursing

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES:

1981	1988
Education	Education
Social Sciences	Social Sciences
Business Administration	Business Administration
Physical Sciences	Physical Sciences

LINCOLN UNIVERSITY

JEFFERSON CITY, MISSOURI

1. MISSION: Lincoln University is one of the oldest institutions of higher education west of the Mississippi. The university was founded by the 62nd and 65th U. S. Colored Infantry units as Lincoln Institute, a school for freed Blacks. Lincoln University was granted state aid for teacher education in 1870 and formally became a state institution in 1890. Lincoln University is a land-grant institution and, as such, provides extension services to the citizens of Missouri. As part of its research and teaching functions, Lincoln University operates two farms and greenhouses which give it a total of 140 rolling acres of land. Lincoln University is a coeducational state-supported institution offering liberal arts, teacher education, and pre-professional training.

2. YEAR FOUNDED: 1866

3. TYPE OF CONTROL: Public

4. TYPE OF INSTITUTION: 4-Year Baccalaureate Degree Programs

5.	PRESIDENTS' HIGHEST DEGREES:	1981: Ph.D.	1988: J.D.
6.	AREAS OF DEGREES:	Administration	Business Law
7.	STUDENT ENROLLMENT:	2,847	3,000

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES:

1981	1988
Education	Education
Economics	Economics
Political Science	Political Science
Psychology	Psychology
History	History
Physics	Physics
Journalism	Journalism
Speech/Theater	Speech/Theater
Fine Arts	Fine Arts
English	English

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES (Continued):

1981	1988
Social Sciences	Social Sciences
Sociology	Sociology
Mathematics	Mathematics
Business Education	Business Education
Economics	Economics

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES:

1981	1988
Education	Education
Social Sciences	Social Sciences
Business Administration	Business Administration

LINCOLN UNIVERSITY

LINCOLN UNIVERSITY, PENNSYLVANIA

1. MISSION: A member of Pennsylvania's Commonwealth System of Higher Education, Lincoln University offers a comprehensive education in the liberal arts through a curriculum which includes training in courses of study that adequately prepare students to meet the challenges and demands of modern-day society. Course offerings encompass a variety of Baccalaureate Degree programs including Biology and Business Administration. According to a recent national survey, Lincoln University was rated among the best small, public colleges and universities in the nation.

2. YEAR FOUNDED: 1854

3. TYPE OF CONTROL: Public

4. TYPE OF INSTITUTION: 4-Year Baccalaureate Degree Programs

5.	PRESIDENTS' HIGHEST DEGREES:	1981: Ph.D.	1988: Ph.D.
6.	AREAS OF DEGREES:	Business	Administration
7.	STUDENT ENROLLMENT:	1,172	2,847

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES:

1981	1988
Education	Education
Economics	Economics
Political Science	Political Science
Psychology	Psychology
History	History
Physics	Physics
Astronomy	Astronomy
Computer Science	Computer Science
	Co-Op Education
	Accounting
	Business Administration
	Mathematics
	Religion & Philosophy

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES:

1981	1988
	Human Services

MEHARRY MEDICAL COLLEGE

NASHVILLE, TENNESSEE

1. MISSION: Meharry Medical College has trained more than 40 percent of all Black physicians and dentists practicing in the United States. It is the largest single educational institution of minority health professionals in the nation. Founded as the Medical Department of Central Tennessee College, its mission was to educate health professionals for the newly-freed slave population. Meharry became an independent medical college in 1915. In 1886, the Department of Dentistry was established, and in 1910, George Hubbard Hospital, the major clinical teaching facility, was opened. Meharry Medical College includes the Schools of Medicine, Dentistry, Graduate/Research West Basic Sciences Center, Community Mental Health Center, and Hubbard Hospital. Meharry Medical College brings empathetic and skilled health care to those populations most in need and provides opportunities for talented and disadvantaged students to obtain an education in the health professions.

2. YEAR FOUNDED: 1876

3. TYPE OF CONTROL: Private

4. TYPE OF INSTITUTION: Professional Graduate Schools

5. PRESIDENTS' HIGHEST DEGREES: 1981: M.D./Ph.D. 1988: Ph.D.

6. AREAS OF DEGREES: Genetics Physics

7. STUDENT ENROLLMENT: 747 1,000

8. MAJOR FIELDS OFFERED LEADING TO GRADUATE DEGREES:

Doctor of Medicine
Doctor of Dental Surgery
Public Health
Behavioral Science
Pharmacology
Microbiology
Pediatrics
Biomedical Sciences
Biochemistry
Health Care Administration
Basic Nursing

MOREHOUSE SCHOOL OF MEDICINE

ATLANTA, GEORGIA

1. MISSION: Morehouse School of Medicine began in 1975 as a medical program within Morehouse College. It was established to meet a national and state need for more primary-care physicians to serve inner-city and rural areas where most minorities and poor people live. It is the first minority medical school to be founded in the 20th century and is one of only four in the nation. Morehouse School of Medicine is now in transition to a four-year, degree-granting institution. In June, 1981, Morehouse School of Medicine was granted authority by the Georgia Department of Education to award the M.D. Degree in 1985. In July, 1982, Morehouse School of Medicine observed a significant milestone in its development with the dedication of a $6.5 million Basic Medical Science Building.

2. YEAR FOUNDED: 1975

3. TYPE OF CONTROL: Private

4. TYPE OF INSTITUTION: Professional Graduate Schools

5. PRESIDENTS' HIGHEST DEGREES:	1981: Ph.D.	1988: Ph.D.
6. AREAS OF DEGREES:	Medical	Medical
7. STUDENT ENROLLMENT:	96	250

8. MAJOR FIELDS OFFERED LEADING TO GRADUATE DEGREES:

Medical Science
Doctor of Medicine
Doctor of Dental Surgery
Public Health
Behavioral Science
Pharmacology
Basic Nursing
Microbiology
Pediatrics
Biomedical Sciences
Biochemistry
Health Care Administration

NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY

GREENSBORO, NORTH CAROLINA

1. MISSION: North Carolina Agricultural and Technical State University provided higher education for citizens of the State since 1891. The University is a thriving educational complex with seven schools, including a Graduate School, a 200-acre main campus, and a 600-acre farm. Its outstanding academic program is supplemented by a viable research program, valued at more than $9 million annually. North Carolina Agricultural and Techncial State University offers programs in Agriculture, Engineering, Professional-Technical Education, and the Liberal Arts.

2. YEAR FOUNDED: 1891

3. TYPE OF CONTROL: Public

4. TYPE OF INSTITUTION: 4-Year Baccalaureate Degree and Graduate Degree Programs

5.	PRESIDENTS' HIGHEST DEGREES:	1981: Ed.D.	1988: Ed.D.
6.	AREAS OF DEGREES:	Education	Education
7.	STUDENT ENROLLMENT:	5,614	5,622

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES:

1981	1988
Education	Agriculture
History	Business Management
Political Science	Computer Science
Social Sciences	Education
Business Administration	Business Administration
Engineering	Engineering
Physical Sciences	Physics
Foreign Language	Foreign Language
Home Economics	Home Economics
Life Sciences	Life Sciences
Mathematics	Mathematics
Physical Sciences	Physical Sciences
Social Sciences	Social Sciences
Performing Arts	Performing Arts

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES:

1981	1988
Education	Education
Engineering	Engineering
Home Economics	Home Economics
Life Sciences	Life Sciences
Mathematics	Mathematics
Physical Sciences	Physical Sciences
Physiology	Physiology
Social Sciences	Social Sciences

PRAIRIE VIEW AGRICULTURAL AND MECHANICAL UNIVERSITY

PRAIRIE VIEW, TEXAS

1. MISSION: Prairie View Agricultural and Mechanical University, founded by the Texas Legislature, and a part of the Texas A & M University System, is a statewide, public coeducational institution and land-grant university authorized under the Morrill Act of 1890. Prairie View A & M University is designated by the Texas Legislature as a special purpose institution for assisting special student populations, and for assisting in the development of small business and small communities. The academic programs lead to Associate's, Baccalaureate, and Master's degrees. The Public Service Program includes a Cooperative Extension Service, Center for Community Affairs and Rural Development, Transportation Center, and Energy Affairs Center. The International Affairs Program serves African and Caribbean countries.

2. YEAR FOUNDED: 1876

3. TYPE OF CONTROL: Public

4. TYPE OF INSTITUTION: 4-Year Baccalaureate Degree and Graduate Degree Programs

5.	PRESIDENTS' HIGHEST DEGREES:	1981: Ph.D.	1988: Ph.D.
6.	AREAS OF DEGREES:	Engineering	Engineering
7.	STUDENT ENROLLMENT:	2,275	4,499

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES:

1981	1988
Arts	Arts
Business	Business
Economics	Economics
English	English
Language	Language
Geography	Geography
History	History
Political Science	Political Science
Recreation	Recreation
Sociology	Sociology

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES (Continued):

1981	1988
Social Work	Social Work
Music	Music
Architecture	Architecture
Agriculture	Agriculture
Biology	Biology
Chemistry	Chemistry
Education	Education
Engineering	Engineering
Home Economics	Home Economics
Industrial Arts Education	Industrial Arts Education
Library Science	Library Science
Mathematics	Mathematics
Medical Technology	Medical Technology
Nursing	Nursing
Physics	Physics
Psychology	Psychology
	Banking & Finance
	Human Development
	Accounting
	Communications
	Cosmetology
	Art Education
	Health Education
	Physical Education
	Welding Technology
	Auto Technology
	Air Conditioning
	Food Science
	Textiles & Clothing
	Life Sciences
	Military Sciences
	Parks/Recreation
	Construction Trade
	Mechanics & Repairers
	Precision Products
	Visual Arts
	Visual Performing Arts
	Music Performance

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES:

1981	1988
Economics	Economics
English	English
History	History

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES (Continued):

1981	1988
Political Science	Political Science
Education	Education
Home Economics	Home Economics
Agriculture	Agriculture
Biology	Biology
Chemistry	Chemistry
Mathematics	Mathematics
Sociology	Sociology
Business	Business
Music	Music
Physical Education	Physical Education
Health Education	Health Education
	Commercial Art
	Natural Resources
	Art Education
	Industrial Arts Education
	Engineering
	Biology
	Mathematics
	Economics

SOUTHERN UNIVERSITY-BATON ROUGE

BATON ROUGE, LOUISIANA

1. MISSION: Southern University-Baton Rouge is a land-grant institution and the oldest and largest member institution in the Southern University System. Southern University-Baton Rouge is located on 884 acres of land, including an Agricultural Experimental Farm for research and teaching. The faculty at Southern University-Baton Rouge are known for their superb teaching abilities and research programs. It is the only campus in the Southern University System to offer post-Baccalaureate degrees.

2. YEAR FOUNDED: 1889

3. TYPE OF CONTROL: Public

4. TYPE OF INSTITUTION: 4-Year Baccalaureate Degree and Graduate Degree Programs

5. PRESIDENTS' HIGHEST DEGREES: 1981: J.D. 1988: J.D.

6.	AREAS OF DEGREES:	Law	Law
7.	STUDENT ENROLLMENT:	9,501	9,444

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES:

1981	1988
Art	Art
Education	Education
Music Education	Music Education
Architecture	Architecture
Business	Business
Vocational Education	Vocational Education
Engineering	Engineering
Industrial Arts Education	Industrial Arts Education
Home Economics	Home Economics
Liberal Studies	Liberal Studies
Print Management	Print Management
Technology	Technology
	Agronomy
	Horticulture
	Soil Science

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES (Continued):

1981	1988
	Marketing
	Journalism
	Accounting
	Animal Science
	Computer Science
	Bilingual Education
	Educational Administration
	Counseling
	Health Education
	Medical Technology
	Health Sciences
	Life Sciences
	Mathematics
	Parks/Recreation
	Philosophy
	Physical Sciences
	Psychology
	Public Affairs
	Geography
	History
	Visual Arts
	Music
	Political Science

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES:

1981	1988
Social Sciences	Social Sciences
Education	Education
Science	Science
Recreation	Recreation
Art Education	Art Education
	Agriculture
	Health Education
	Mathematics
	Home Economics
	Music Education
	Trade/Industrial Arts Education
	Engineering
	Parks/Recreation
	Chemistry
	Psychology
	Public Affairs

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES:

1981	1988
	History
	Political Science

SOUTHERN UNIVERSITY-NEW ORLEANS

NEW ORLEANS, LOUISIANA

1. MISSION: Southern University in New Orleans is a commuter college serving the greater New Orleans area. Its programs are geared toward emphasis in the liberal arts. It is concerned with providing students with the opportunities to develop themselves into useful, community participating citizens. Southern University offers Bachelor's Degree programs in twenty-one areas in its Divisions of Business, Education, Humanities, Science and Social Sciences; and the Associate's Degree programs in Computer Science, General Stenography, Medical Stenography, and other course offerings.

2.	YEAR FOUNDED:	1956	
3.	TYPE OF CONTROL:	Public	
4.	TYPE OF INSTITUTION:	4-Year Baccalaureate Degree and Graduate Degree Programs	
5.	PRESIDENTS' HIGHEST DEGREES:	1981: Ph.D.	1988: Ph.D.
6.	AREAS OF DEGREES:	Political Science	Political Science
7.	STUDENT ENROLLMENT:	2,819	3,000

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES:

1981	1988
Accounting	Accounting
Allied Health	Allied Health
Biology	Biology
Business	Business
Chemistry	Chemistry
Computer Science	Computer Science
Criminal Justice	Criminal Justice
Education	Education
Economics	Economics
French	French
Health	Health
Physical Education	Physical Education
History	History
Mathematics	Mathematics

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES (Continued):

1981	1988
Physics	Physics
Political Science	Political Science
Psychology	Psychology
Social Sciences	Social Sciences
Social Welfare	Social Welfare
Substance Abuse	Substance Abuse
Technology	Technology
	Afro-American Studies
	Transportation
	Management
	Real Estate
	Legal Sect
	Medical Sect
	Journalism
	Computer Programming
	Spanish
	Sociology
	Visual Arts
	Urban Studies
	Public Affairs

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES:

1981	1988
Social Work	Social Work

SPELMAN COLLEGE

ATLANTA, GEORGIA

1. MISSION: Spelman College is the nation's oldest and best-known historically Black liberal arts college for women and is a member of the Atlanta University Center Consortium of six institutions of higher education. Spelman College provides programs and services designed to foster the intellectual, social, personal, and professional development of its students. The education program at Spelman is designed to give students a comprehensive background through study in the fine arts, humanities, social sciences, and natural sciences. Spelman College has been and expects to continue to be a major resource for educating Black women leaders.

2. YEAR FOUNDED: 1881

3. TYPE OF CONTROL: Private

4. TYPE OF INSTITUTION: 4-Year Institution

5.	PRESIDENTS' HIGHEST DEGREES:	1981: Ph.D.	1988: Ph.D.
6.	AREAS OF DEGREES:	Public Administration	Public Administration
7.	STUDENT ENROLLMENT:	1,458	1,642

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES:

1981	1988
Arts	Arts
Drama	Drama
Languages	Languages
Social Sciences	Social Sciences
History	History
Psychology	Psychology
English	English
Mathematics	Mathematics
Sociology	Sociology
Music	Music
Biology	Biology
Home Economics	Home Economics
Physical Education	Physical Education

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES (Continued):

1981	1988
Chemistry	Chemistry
Computer Science	Computer Science
Natural Sciences	Natural Sciences
Philosophy	Philosophy
Religion	Religion
Engineering	Engineering
Education	Education
	Languages
	Health Sciences
	Guidance/Counseling
	Physics

TUSKEGEE UNIVERSITY

TUSKEGEE, ALABAMA

1. MISSION: Tuskegee University was founded as a coeducational, privately controlled, professional, scientific, and technical institution. Tuskegee University is engaged in fundamental research and extends its programs to other areas of human endeavor in the interest of service to the total society. Tuskegee University's curricula is designed to prepare students for significant performance in professional, scientific, and high-level technical careers. The university concentrates on furthering the development of students in the utilization of communication skills, scientific knowledge, and the finer human experiences related to literature and arts.

2.	YEAR FOUNDED:	1881	
3.	TYPE OF CONTROL:	Private	
4.	TYPE OF INSTITUTION:	4-Year Baccalaureate Degree Programs and Professional Graduate Schools	
5.	PRESIDENTS' HIGHEST DEGREES:	1981: Ph.D.	1988: Ph.D.
6.	AREAS OF DEGREES:	Philosophy	Philosophy
7.	STUDENT ENROLLMENT:	1,733	3,400

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES:

1981	1988
Social Sciences	Social Sciences
Natural Sciences	Natural Sciences
Agriculture	Agriculture
Education	Education
Home Economics	Home Economics
Food Administration	Food Administration
Architecture Technology	Architecture Technology
Nursing	Nursing
Physical Education	Physical Education
Accounting	Accounting
Business Administration	Business Administration

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES (Continued):

1981	1988
	Biology
	Chemistry
	Mathematics
	Physics
	Political Science
	Social Work
	Sociology
	Accounting
	Business Administration
	Finance
	Marketing

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES:

1981	1988
Chemistry	Chemistry
Biology	Biology
Agriculture	Agriculture
Engineering	Engineering
Home Economics	Home Economics
Education	Education
Nutrition	Nutrition
Veterinary Medicine	Veterinary Medicine
Environmental Sciences	Environmental Sciences

UNIVERSITY OF ARKANSAS

PINE BLUFF, ARKANSAS

1. MISSION: The University of Arkansas at Pine Bluff is a part of the network of institutions comprising the University of Arkansas System. It is a state-supported land-grant institution, created by an act of the Arkansas Legislature in 1872. Its mission was to serve as an extension of the University of Arkansas for the poorer classes of Black Americans. In 1928, it was named Arkansas AM&N College, which distinguished it as a quality institution for the education of Arkansas' Black population. In 1972, it became a part of the University of Arkansas. Three academic divisions, Agriculture and Technology, Arts and Sciences, and Teacher Education, offer degree programs in over 50 disciplines. The University of Arkansas at Pine Bluff is the largest institution of higher learning in southeast Arkansas and is noted for outstanding success and contributions of its graduates, particularly in the field of education, medicine, and government.

2. YEAR FOUNDED: 1873

3. TYPE OF CONTROL: Public

4. TYPE OF INSTITUTION: 4-Year Baccalaureate Degree and Graduate Degree Programs

5.	PRESIDENTS' HIGHEST DEGREES:	1981: Ph.D.	1988: Ph.D.
6.	AREAS OF DEGREES:	Pharmacology	Psychology
7.	STUDENT ENROLLMENT:	2,545	2,545

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES:

1981	1988
Accounting	Accounting
Agronomy	Agronomy
Agriculture	Agriculture
Animal Science	Animal Science
Education	Education
Business	Business
Administration	Administration
Chemistry	Chemistry

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES (Continued):

1981	1988
Computer Science	Computer Science
Fashion Sales	Fashion Sales
Nutrition	Nutrition
Gerontology	Gerontology
Health Education	Health Education
Home Economics	Home Economics
Industrial Arts	Industrial Arts
Mathematics	Mathematics
Music	Music
Nursing	Nursing
Parks/Recreation	Parks/Recreation
Physics	Phsyics
Political Science	Political Science
Psychology	Psychology
Social Sciences	Social Sciences
Sociology	Sociology
Speech/Drama	Speech/Drama
Trade/Industrial Arts	Trade/Industrial Arts
	Art Education
	Automobile Technology
	Biology
	Business Administration
	Family Development
	Criminal Justice
	Computer Science
	Economics
	Institutional Administration
	Fisheries Biology
	Functional Arts
	General Studies
	History
	Community Development

VIRGINIA STATE UNIVERSITY

PETERSBURG, VIRGINIA

1. MISSION: Virginia State University is one of the two land-grant universities in the Commonwealth of Virginia. It was founded in 1882 and is one of the first fully state-supported, four-year Bachelor's Degree colleges in America. It is an institution of higher education under the governing authority of a Board of Visitors. It serves the Commonwealth by studying life in the State and by cooperating with all agencies that seek to achieve conditions under which individuals may have the opportunity to share in the common life according to the individual's interest and capacities.

2.	YEAR FOUNDED:	1882	
3.	TYPE OF CONTROL:	Public	
4.	TYPE OF INSTITUTION:	4-Year Baccalaureate Degree and Graduate Degree Programs	
5.	PRESIDENTS' HIGHEST DEGREES:	1981: Ph.D.	1988: Ph.D.
6.	AREAS OF DEGREES:	Physiology	Physiology
7.	STUDENT ENROLLMENT:	4,279	4,699

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES:

1981	1988
Accounting	Accounting
Agriculture	Agriculture
Economics	Economics
Animal Science	Animal Science
Pre-Veterinary	Pre-Veterinary
Biology	Biology
Business	Business
Chemistry	Chemistry
Commercial Art	Commercial Art
Design	Design
Earth Science	Earth Science
Education	Education
Engineering Technology	Engineering Technology
English	English
Environmental Sciences	Environmental Sciences

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES (Continued):

1981	1988
Fine Arts	Fine Arts
Food Industry	Food Industry
Language	Language
Geology	Geology
Health	Health
Home Economics	Home Economics
Hotel/Restaurant Management	Hotel/Restaurant Management
Industrial Arts Education	Industrial Arts Education
Mathematics	Mathematics
Music	Music
Nursing	Nursing
Physical Education	Physical Education
Physics	Physics
P/S/W Science	P/S/W Science
Political Science	Political Science
Psychology	Psychology
Public Administration	Public Administration
Recreational Education	Recreational Education
Social Studies	Social Studies
Vocational Education	Vocational Education
Special Education	Special Education
	Plant Science
	Reading Education
	Statistics
	International Relations
	Political Science/ Government

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES:

1981	1988
Agricultural Education	Agricultural Education
Biology	Biology
Business Education	Business Education
Education	Education
Earth Science	Earth Science
Economics	Economics
Educational Administration	Educational Administration
English	English
Guidance	Guidance
History	History
Home Economics	Home Economics
Music Education	Music Education

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES (Continued):

1981	1988
Industrial Arts Education	Industrial Arts Education
Mathematics	Mathematics
Physics	Physics
Psychology	Psychology
Science Education	Science Education
Social Studies	Social Studies
Vocational Education	Vocational Education
	Counseling
	Interdisciplinary Studies

XAVIER UNIVERSITY

NEW ORLEANS, LOUISIANA

1. MISSION: Xavier University of Louisiana is located in the heart of New Orleans, Louisiana, and is the only historically Black institution of higher education operated under the Catholic auspices. Xavier University is administered under a combined lay/religious board of trustees, faculty, and administration headed by its president. Xavier University is a liberal arts oriented university which offers more than three dozen majors. Degrees are awarded in areas of Science, Pharmacy, Music, and Arts. Xavier University educates one-tenth of all Black students who receive degrees in Pharmacy.

2. YEAR FOUNDED: 1915

3. TYPE OF CONTROL: Private

4. TYPE OF INSTITUTION: 4-Year Baccalaureate Degree and Graduate Degree Programs

5.	PRESIDENTS' HIGHEST DEGREES:	1981: J.D.	1988: J.D.
6.	AREAS OF DEGREES:	Law	Law
7.	STUDENT ENROLLMENT:	2,035	3,500

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES:

1981	1988
Accounting	Accounting
Business	Business
Marketing	Marketing
	Radio
	Computer Science
	Curriculum/Instruction
	Education
	Speech
	Counseling
	English
	Languages
	Mathematics
	Music
	Physical Education

8. MAJOR FIELDS/COURSES OFFERED LEADING TO BACCALAUREATE DEGREES (Continued):

1981	1988
	Science
	Engineering
	French
	Medical Library
	Pharmacy
	English
	Biology
	Microbiology
	Biochemistry
	Art Education
	Parks/Recreation
	Philosophy
	Chemistry
	Social Work
	Fine Arts
	History
	Psychology
	Physics

9. MAJOR FIELDS/COURSES OFFERED LEADING TO GRADUATE DEGREES:

1981	1988
	Curriculum/Instruction
	Educational Administration
	Counseling

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